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ABSTRACT

The Thomas Jefferson High School for Science and Technology (Fairfax County, Virginia) offers a comprehensive college preparatory program emphasizing the sciences, mathematics, and technology. The school serves students selected on the basis of aptitude and interest in the biological, physical, mathematical, and computer sciences, and who intend to persue college preparation in the sciences, engineering, or related fields. During the planning phase that preceded the actual opening of the school, a survey of students was conducted in order to determine opinions relative to the school and to solicit ideas and suggestions about its development and/or operation. This document provides an analysis of the data collected in the survey. Data were collected and analyzed according to grade, sex, ethnic origin, and by item. Results indicated that the school should be established, although only about 25% of the students surveyed indicated that they would be interested in attending such a school. Concerns of the students included an apparent limit to extracurricular activities and the travel time needed to attend the school. Data is displayed in 33 figures. The survey instrument is appended. (TW)

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SCHOOL FOR SCIENCE AND TECHNOLOGY

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An Analysis of the Student Survey

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Fairfax County Public Schools April, 1984

SCHOOL FOR SCIENCE AND TECHNOLOGY

AN ANALYSIS OF THE STUDENT SURVEY

FAIRFAX COUNTY PUBLIC SCHOOLS
APRIL 1984

AN ANALYSIS OF THE RESULTS OF THE STUDENT SURVEY CONCERNING THE SCHOOL FOR SCIENCE & TECHNOLOGY

Fairfax County Public Schools
April 1984

INTRODUCTION

On January 5, 1984, Fairfax County Public Schools announced plans to develop a school for science and technology to serve high school students in the school division. This announcement followed eight weeks of planning and discussion with the Superintendent's Business/Industry Advisory Council and the Fairfax County Public Schools Leadership Team and other staff members. Part of the plan specified that a survey of students be conducted in order to determine opinions relative to the school and to solicit ideas and suggestions about its development and/or operation.

THE PLAN FOR ESTABLISHING THE SCHOOL

The goal for this planning activity is to establish a school for science and technology in the Fairfax County Public School division to be opened no later than school year 1985-86. Seven objectives are specified as follows:

1. To initiate, develop, and maintain a close cooperative and collaborative relationship with the business and industrial community in the design, conduct, assessment, and continual updating of the school and its programs.

2. To create a high school environment for state-of-the-art instruction and learning experiences designed to enhance the opportunities interested students have in acquiring more specific and advanced skills

in and knowledges about selected sciences and high technology specialties.

3. To include specialized laboratory environments in selected high technology areas to include detailed and explicit interfaces with and requirements for interdisciplinary instruction in the mathematics and science curriculum areas.

4. To design an exemplary and unique high school program that assures completion of the requirements for graduation; superior preparation for access to collegiate admission and other post-secondary educational opportunities in science, engineering, and technology; and opportunity and skills for immediate employment upon graduation in selected high technology, scientific, and engineering occupations.

5. To identify sources of potential support and to solicit and obtain resources to assist in the timely and effective realization of the school.

6. To design, construct (or renovate), and equip an appropriate facility to house the proposed school and its complement of supporting programs and services.

7. To initiate and maintain, with the school for science and technology the focus, a strong and continuing program of teacher inservice and other appropriate experiences in selected high technology laboratory environments to include opportunities for younger student participation in selected experiences and events.

A major task identified under Objective #2 above was to "Interview and/or conduct surveys of the student body to determine levels of interest and to solicit opinions and suggestions relative to the proposed operation of the

school." The strategies for the accomplishment of this task included the design of a survey to collect and analyze data from students relative to the proposed school, to analyze these data, and to consider the results of the survey in making planning decisions. It was in response to this task that the survey reported by this document was conducted.

INSTRUMENTATION

The survey instrument was designed using similar instruments developed by the Department of Educational Accountability of the Montgomery County Public Schools, Rockville, Maryland entitled "Feasibility Study of A Secondary School Program in Math/Science/Computer Science--STUDENT SURVEY and PARENT SURVEY". Copies of the final Fairfax County Public Schools student survey instrument and the administration guide for the survey appear as Appendix A of this report.

PROCEDURES

Sample Selection

The twenty-three high schools in Fairfax County were randomly divided into two groups. One group of twelve schools was instructed to survey 9th and 11th grade students. The other group of eleven schools was instructed to survey 10th and 12th grade students. Since only those students in 9th and 10th grades would actually be eligible to attend the school (opening in the Fall of 1985) it was decided that the larger sample should be directed to these two grade levels.

School principals were advised to plan for the administration of the survey to all 9th grade students (for those schools designated to survey 9th graders) and to all 10th grade students (for those schools designated to survey 10th graders). All surveys were to be administered during English classes. In addition, school principals were asked to identify 10% of the respective 11th

or 12th grade students (by randomly selecting 1/10 of the junior or senior English classes). Appendix B contains the form used to estimate materials needed (surveys, answer sheets, administration guides) by each school. Table I below details the distribution by school.

TABLE I
Survey Distribution & Return By School

School	Grade Levels	No. Surveys Distributed	No. Surveys Returned
Annandale	9 & 11	450	338
Chantilly	10 & 12	720	377
Edison	9 & 11	510	296
Fairfax	10 & 12	570	319
Falls Church	10 & 12	690	519
Fort Hunt	9 & 11	390	321
Groveton	10 & 12	600	338
Hayfield	9 & 11	660	507
Herndon	10 & 12	720	493
Jefferson	9 & 11	510	231
Lake Braddock	9 & 11	920	766
Langley	9 & 11	810	530
Lee	10 & 12	540	350
Madison	10 & 12	600	403
Marshall	10 & 12	480	319
McLean	9 & 11	450	331
Mount Vernon	9 & 11	510	313
Oakton	10 & 12	840	580
Robinson	10 & 12	990	703
South Lakes	10 & 12	600	432
Stuart	9 & 11	450	298
West Springfield	9 & 11	870	858
Woodson	9 & 11	690	654
TOTAL		14570	10276

Survey Administration

On February 17, 1984, all high school principals in Fairfax County Public Schools were advised that the student survey concerning the School for Science and Technology would be administered in English classes on March 14, 1984. English faculties were advised by principals in order that appropriate class plans could be completed prior to the survey administration. On March 14 English teachers were asked to read the program description contained within the "Directions for Survey Administration" (See Appendix A) to their classes. Students were advised that participation was voluntary. Administration took approximately fifteen minutes.

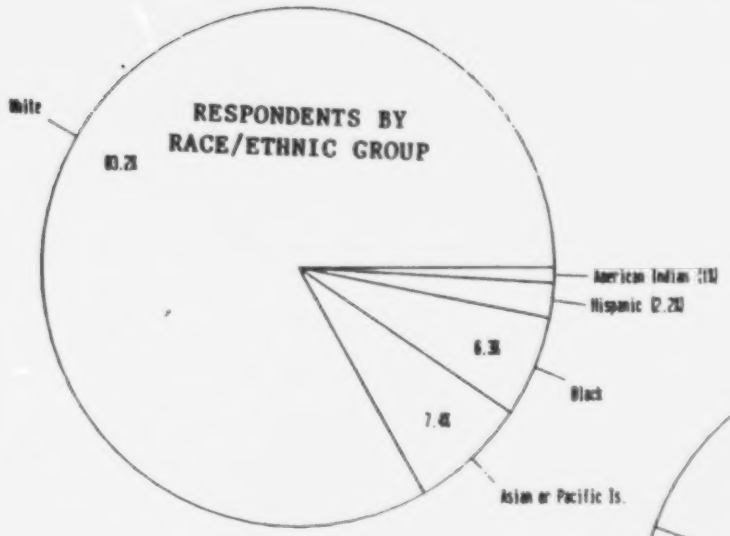
Data Procedures

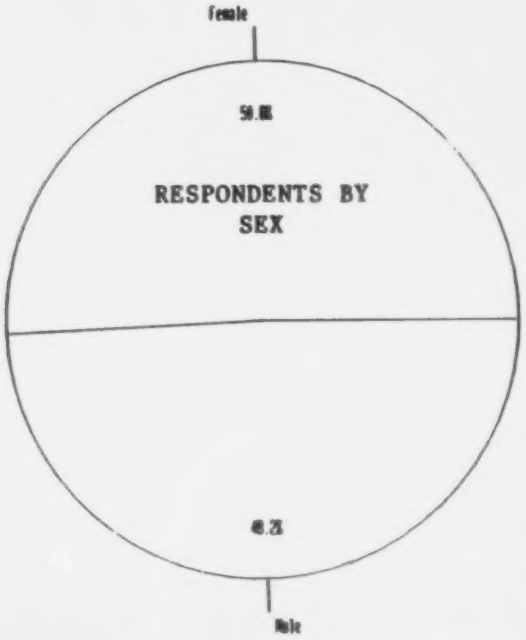
Data were collected for analysis by grade, by sex, by ethnic origin and by item with percentages responding for each item option reported. In addition, means and standard deviations were calculated for items where such statistics were meaningful.

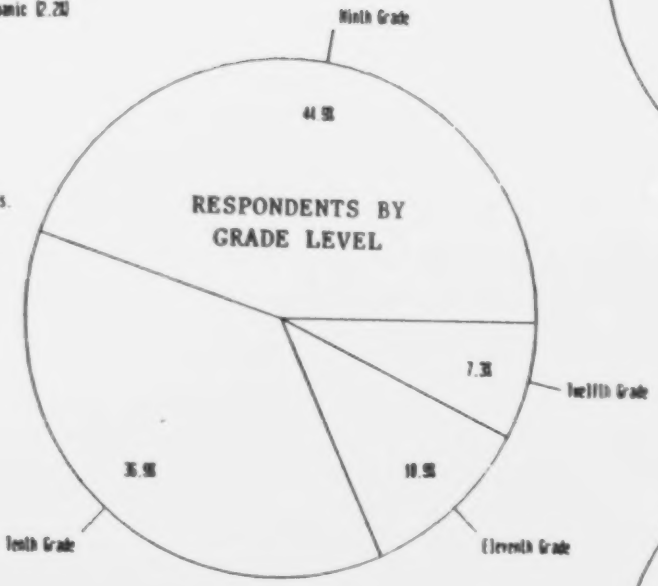
RESULTS OF THE ANALYSIS

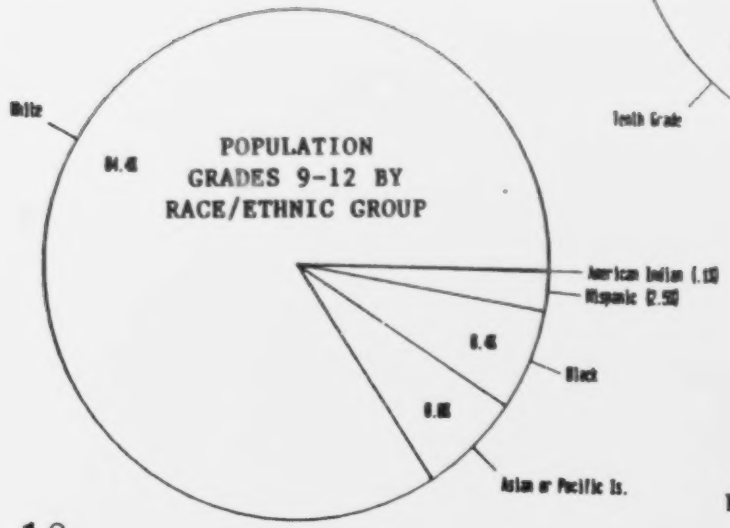
Description of the Sample

Responses collected totaled 10,276. The responses represented 44.2% of the ninth grade class; 36.3% of the tenth grade; 11.6% of the eleventh grade; and 7.8% of the twelfth grade with March, 1984, membership data by grade as the basis. Respondents by sex and by race/ethnic group for the sample and for the high school population in total are demonstrated by Figure 1. These data









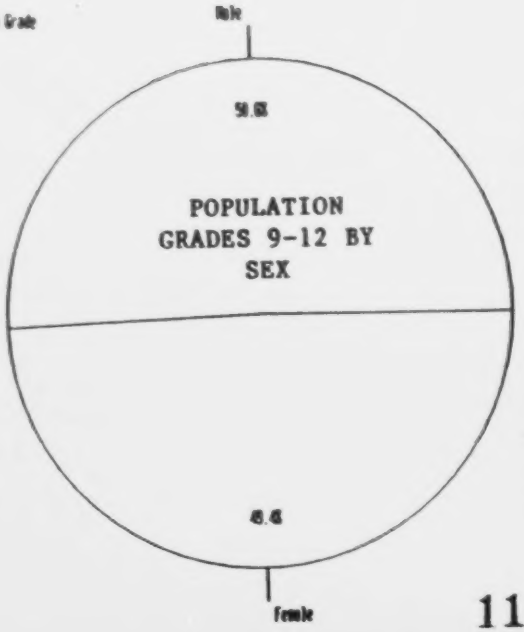


FIGURE 1
REPRESENTATION BY SAMPLE

reflect the excellent comparability of the sample to the population. In addition, Figure 1 displays the actual breakout by grade of the respondents.

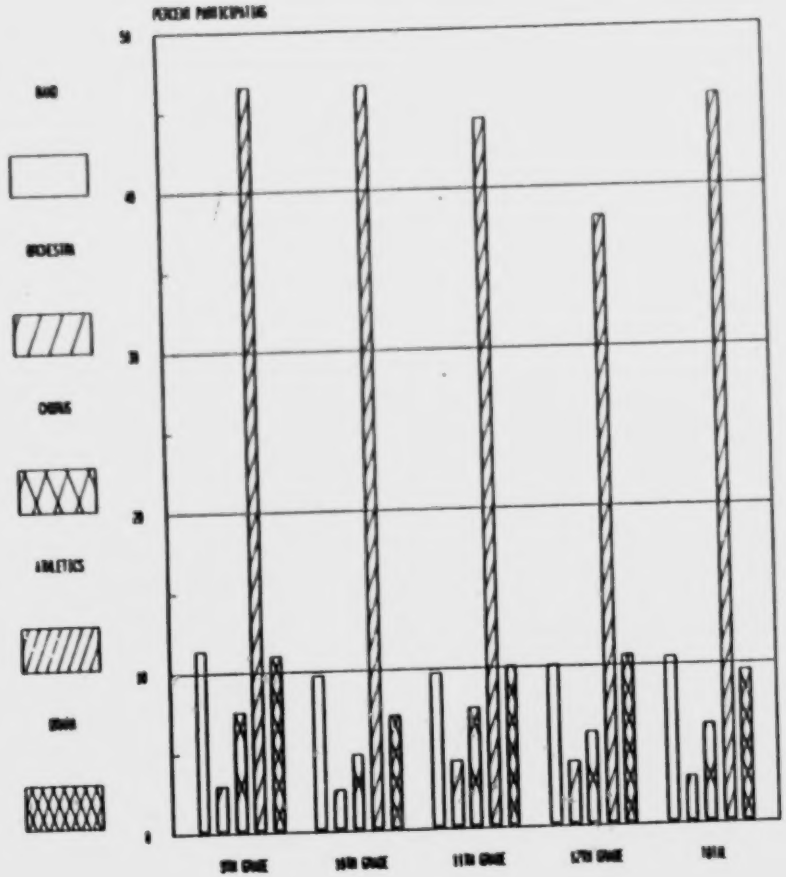
Extracurricular Activities

Since it was apparent that a specialized high school may be able to offer only limited extracurricular activities it was determined that the extent of participation by current students was an important factor to consider. Of all respondents, 10.5% reported that they participated in band, 3% in orchestra, 6.3% in chorus, 45.7% in athletics, 9.5% in drama, and 40.6% in "other" extracurricular activities. Figure 2 displays these data by grade level, by sex/by grade level, and Figure 3 by race/ethnic origin.

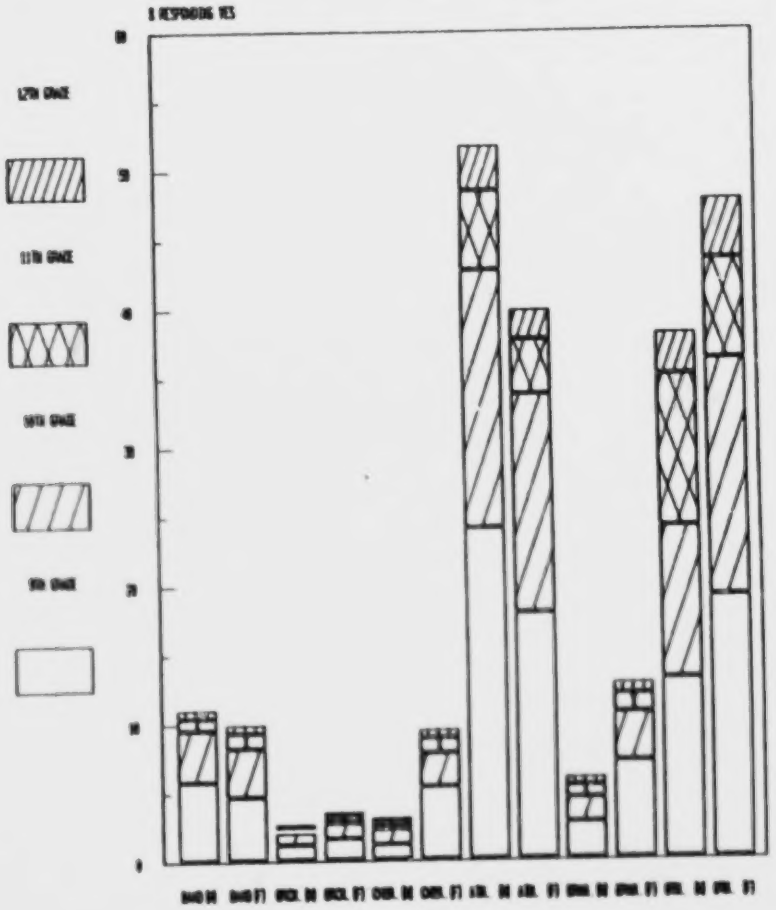
Disincentives to Enroll

Over one-half of all respondents (5922 or 58.8%) indicated that having to travel by school bus from their neighborhoods to the School for Science and Technology would not discourage them from attending (seniors would be the most discouraged by such travel—freshmen the least discouraged). Only 11.2% (1130) indicated that such a condition would definitely discourage them from attending. Having fewer extracurricular activities would not discourage 26.4% but would definitely discourage 27.8% (seniors would be the least discouraged by this aspect with ninth, tenth and eleventh about equal in their levels of discouragement). Having fewer electives would not discourage 16.1% and would discourage 35.4% (tenth grade students would be the least discouraged by this condition and seniors the most). Having to leave friends would not discourage 9.9% and would discourage 59.7% (seniors would be the least discouraged by this factor and freshmen the most).

Figures 4 & 5 (pages 11 & 12) display these data by grade. Figures 6 & 7 (pages 13 & 14) display these data by sex, and Figure 8 (page 15) displays the Race/Ethnic Group data.



BY GRADE



BY SEX BY PERCENT OF SAMPLE
BY GRADE

FIGURE 2
PARTICIPATION IN EXTRACURRICULAR
ACTIVITIES

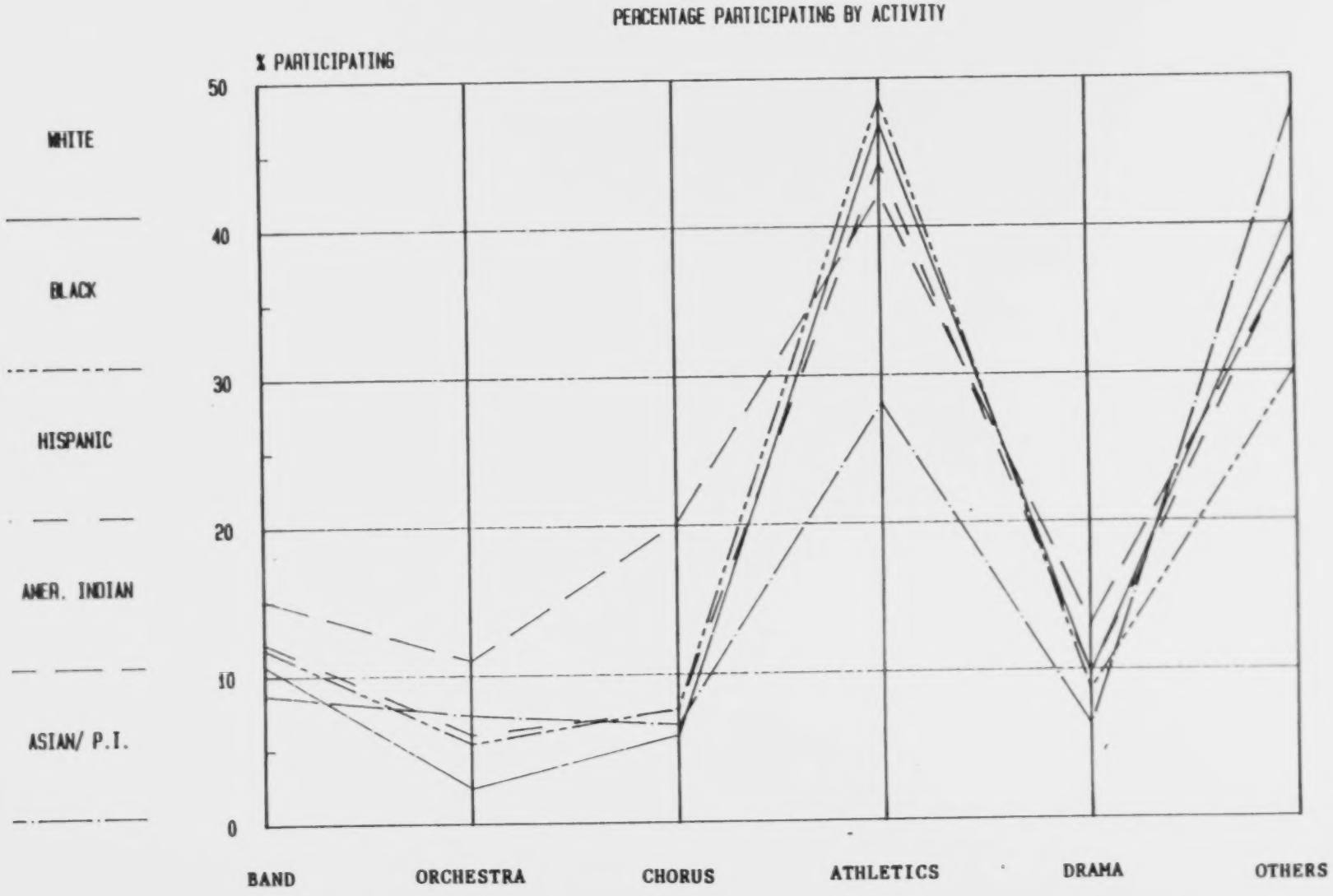


FIGURE 3
PARTICIPATION IN EXTRACURRICULAR ACTIVITIES
BY RACE/ETHNIC GROUP

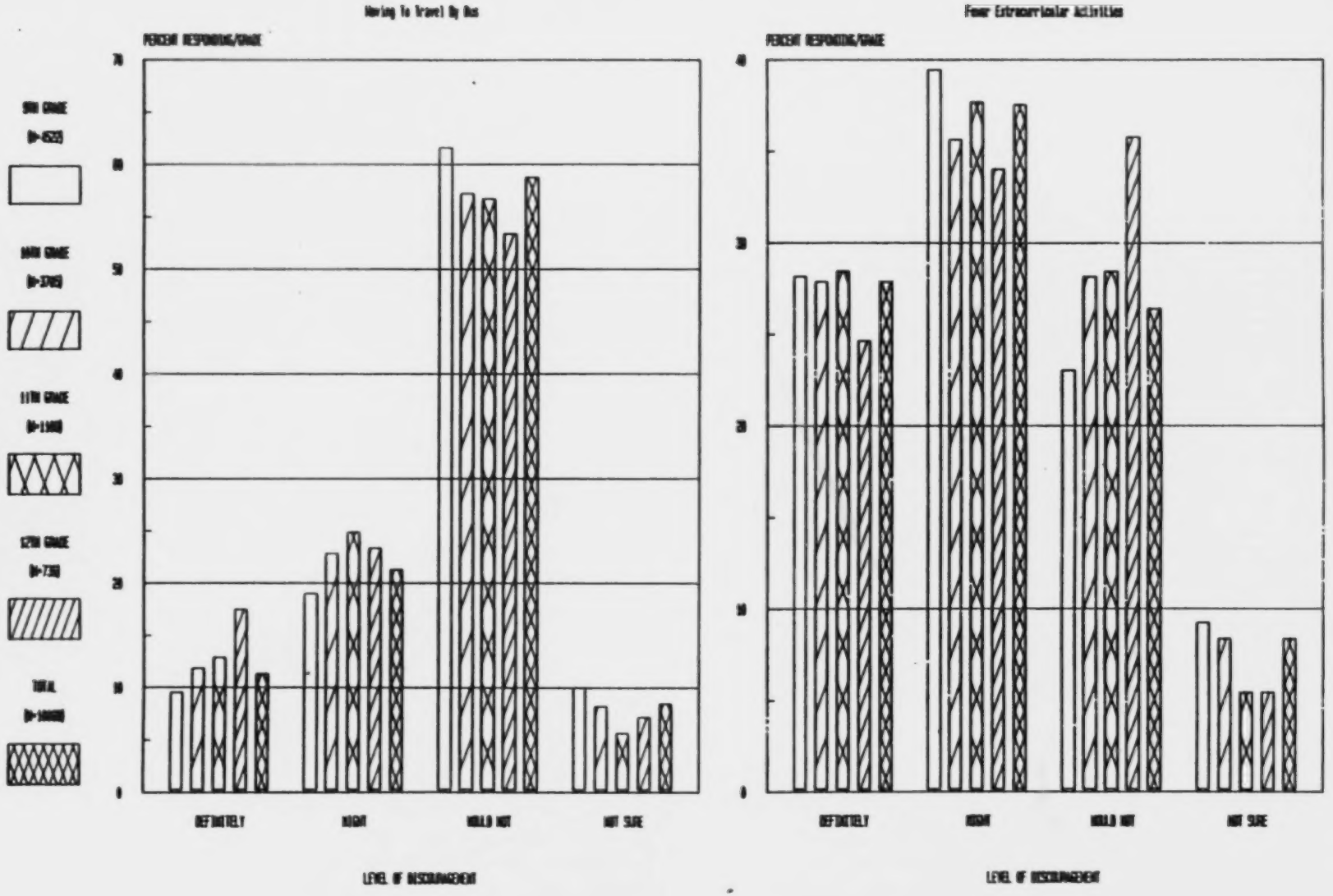


FIGURE 4
DISINCENTIVES TO ENROLL
BY GRADE LEVEL

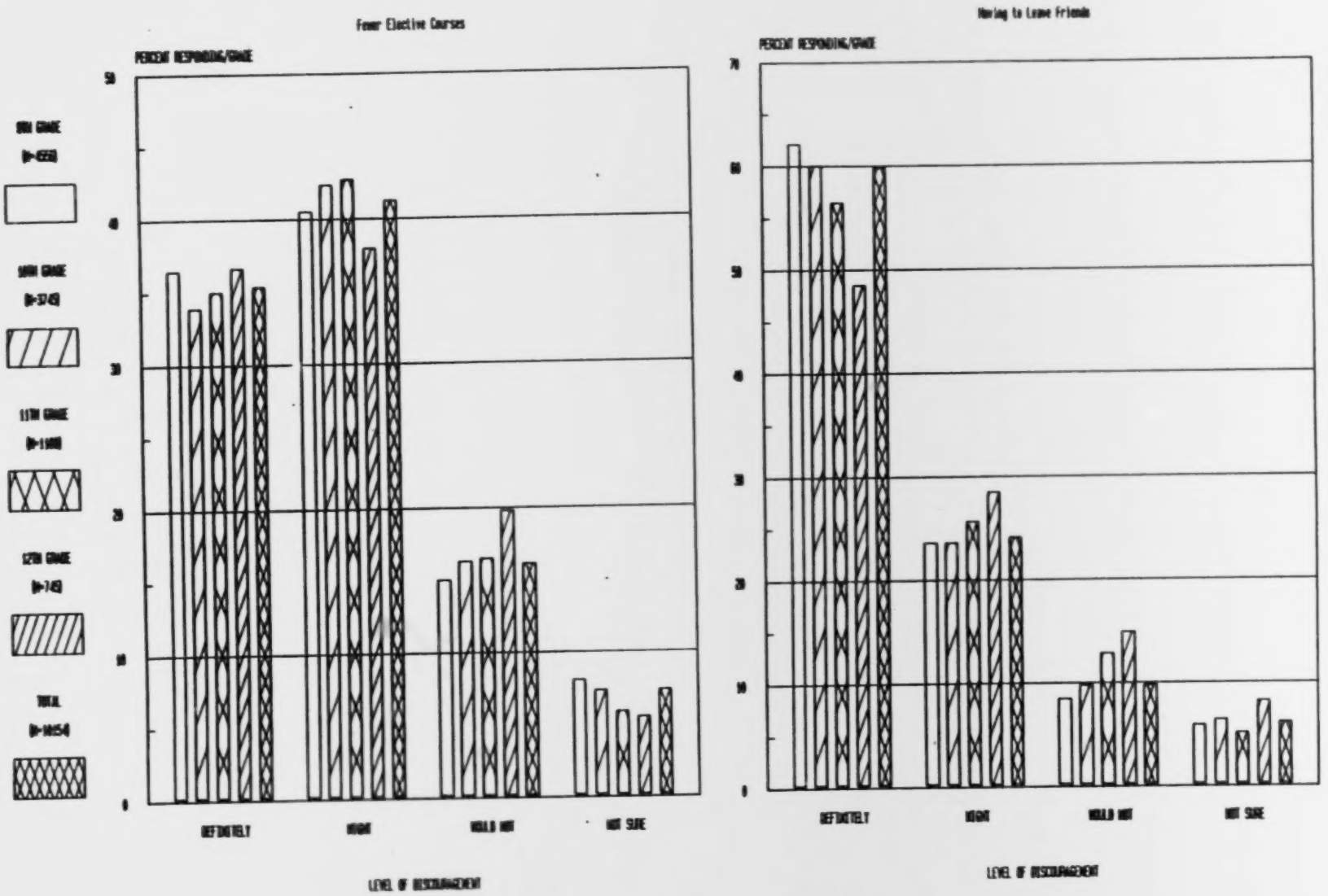


FIGURE 5
DISINCENTIVES TO ENROLL
BY GRADE LEVEL

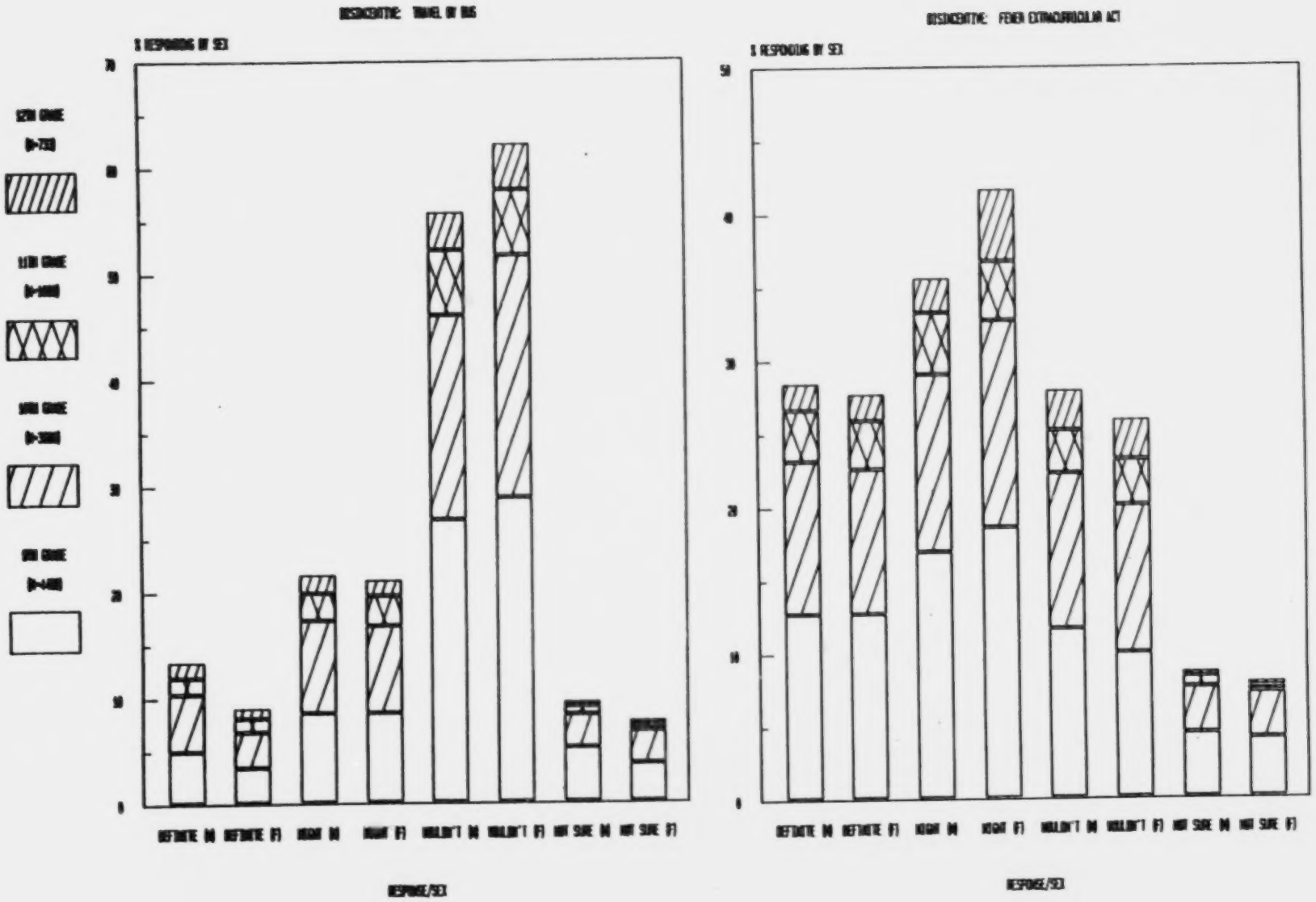


FIGURE 6
DISINCENTIVES TO ENROLL
BY SEX

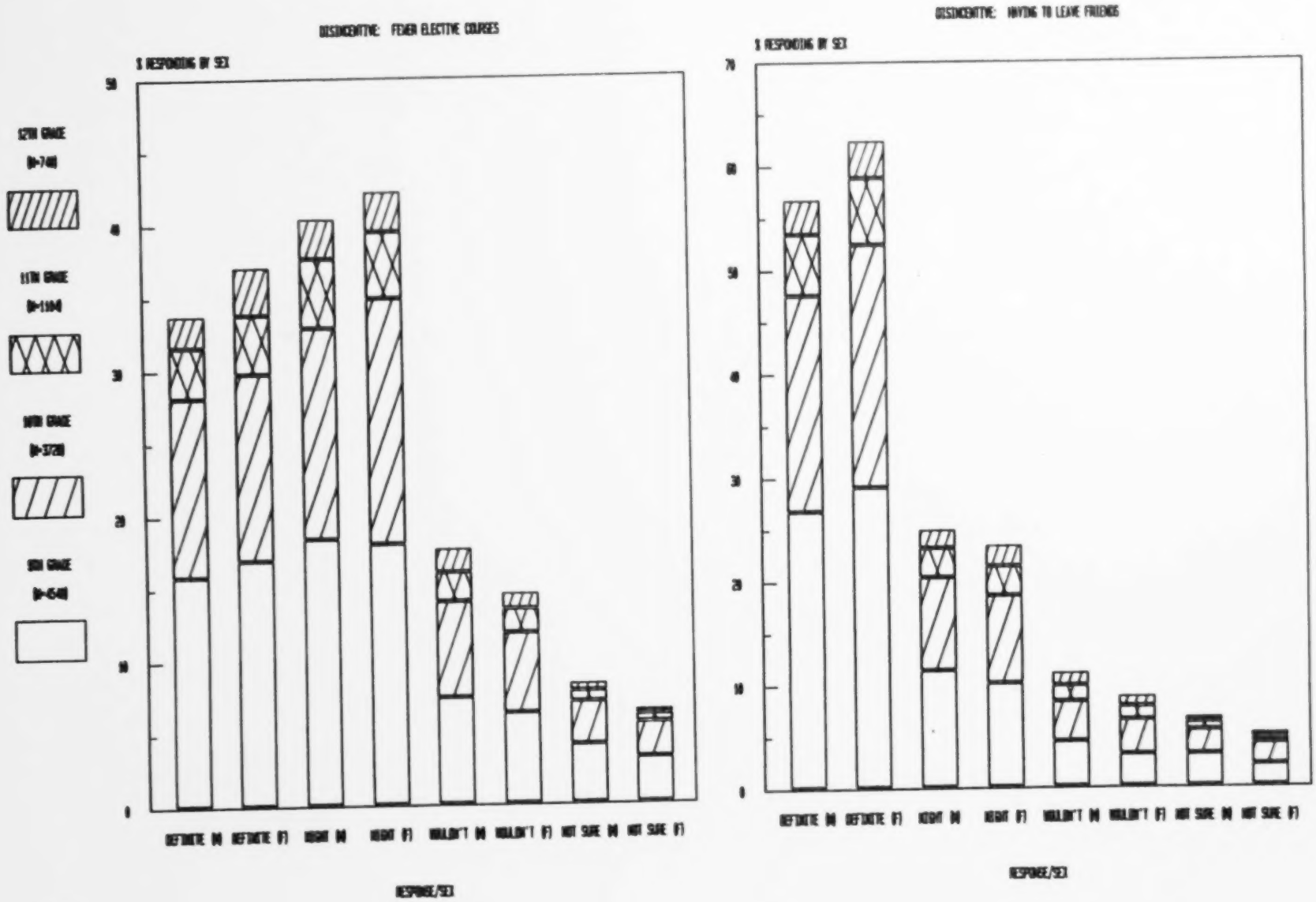
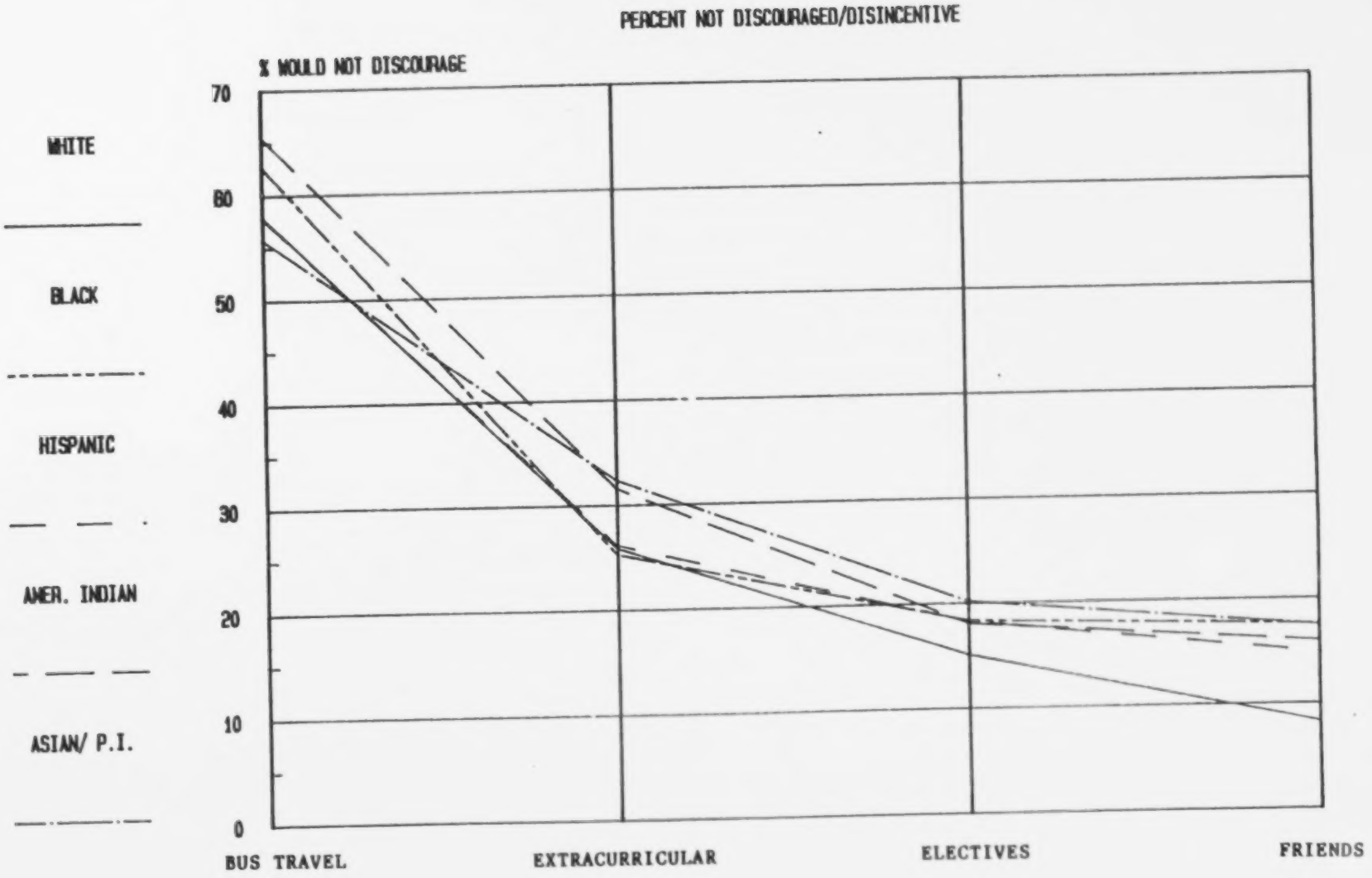


FIGURE 7
DISINCENTIVES TO ENROLL
BY SEX



School for Science & Technology
Student Survey
15

FIGURE 8
DISINCENTIVES TO ENROLL
BY RACE/ETHNIC GROUP

Opinions About the School

That Fairfax County Public Schools should have a School for Science and Technology was agreed to by over half of the respondents (5383 or 53.1%). Ninth grade students agreed (percent agree + percent strongly agree) with this statement the least of the four classes. Of the total 5383 students who agreed, 15.2% strongly agreed that FCPS should have a School for Science and Technology. Although 53.1% agreed that FCPS should have a School for Science and Technology only 25.2% (2556) stated that they would be interested in attending such a school. However, it is important to note that 34.8% of the respondents (3534) stated that they were uncertain about this particular question, the highest percent of uncertainty on any of the questions. The next highest percent uncertain was in relation to the statement "FCPS should have a School for Science and Technology" with 34.6% (3507). The highest percentage of interest in attending the school rested with seniors (28.6%), followed by juniors (26.3%), freshmen (25%) and then sophomores (24.4%). The highest degree of uncertainty was indicated by freshmen (36.4%). See Figure 9 (page 17) for a breakdown by grade and Figures 14 & 15 (pages 23 & 24) for a breakdown by sex. Figure 16 (page 25) presents the breakdown by race/ethnic group.

Only 32.3% (3275) agreed that just 11th and 12th grade students should attend the school. Approximately 46% disagreed with this statement (4698) with 2166 responding as uncertain. Unpredictably, 35.9% of the seniors and 39.2% of the juniors disagreed while predictably 46.2% of the seniors and 39.3% of the juniors agreed. Both freshmen and sophomores agreed less with this statement (25.8% & 35.4% respectively) than the upper classes. Freshmen evidenced the strongest percent disagreement (52.6%) followed by sophomores (42.9%). In response to the item asking if students should have to pass an exam to enter the school, a suprising 55% agreed (18.5% strongly agreeing) while only 25.7% disagreed (11.1% strongly disagreeing). This level of agreement (over 50%) was constant across all classes ranging from a low of 53.6% for tenth graders to a high of 56.5% for juniors. See Figures 10 (page 18), 14, 15 & 16 (pages 23-25) for more detail.

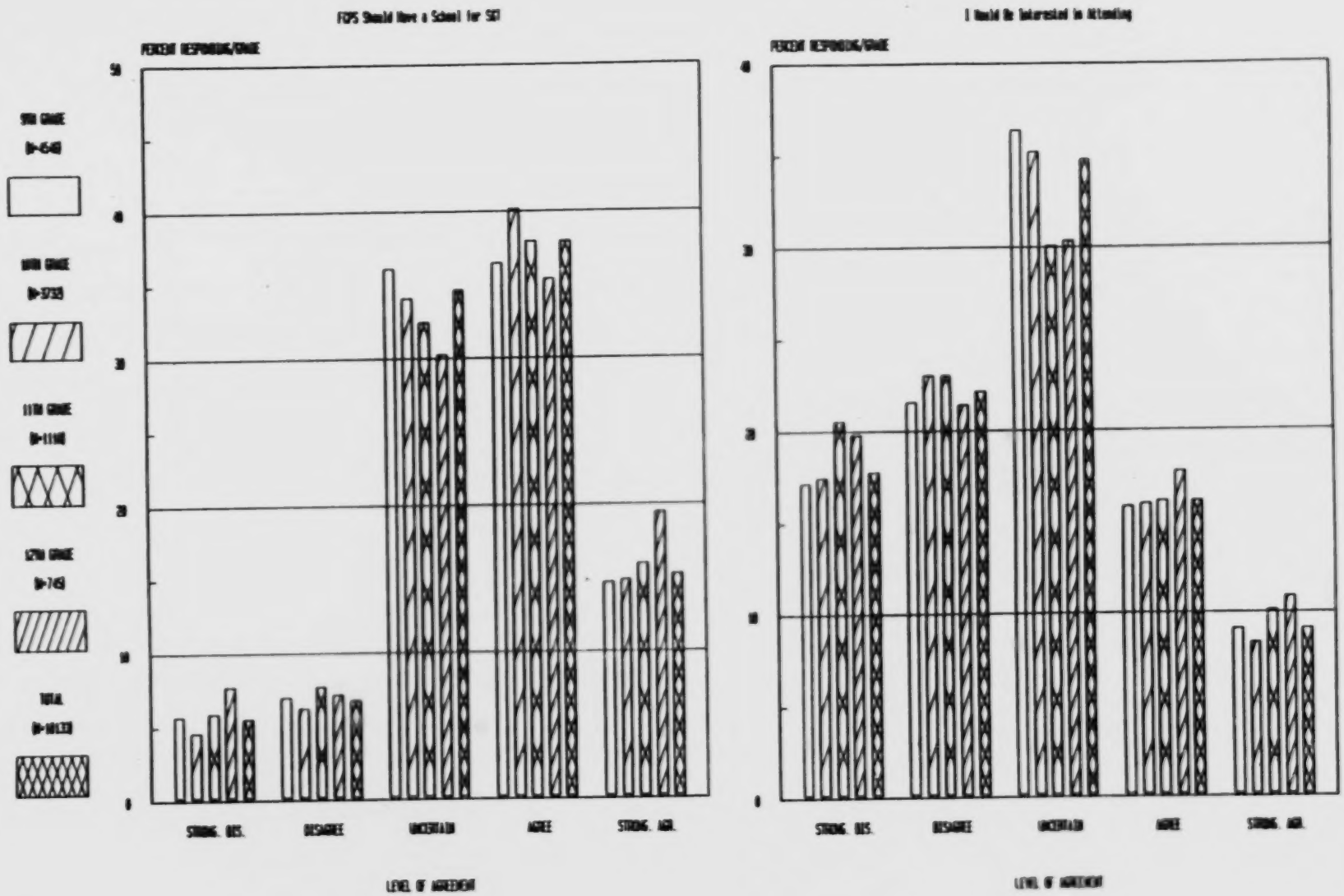


FIGURE 9
STUDENT OPINION
BY GRADE LEVEL

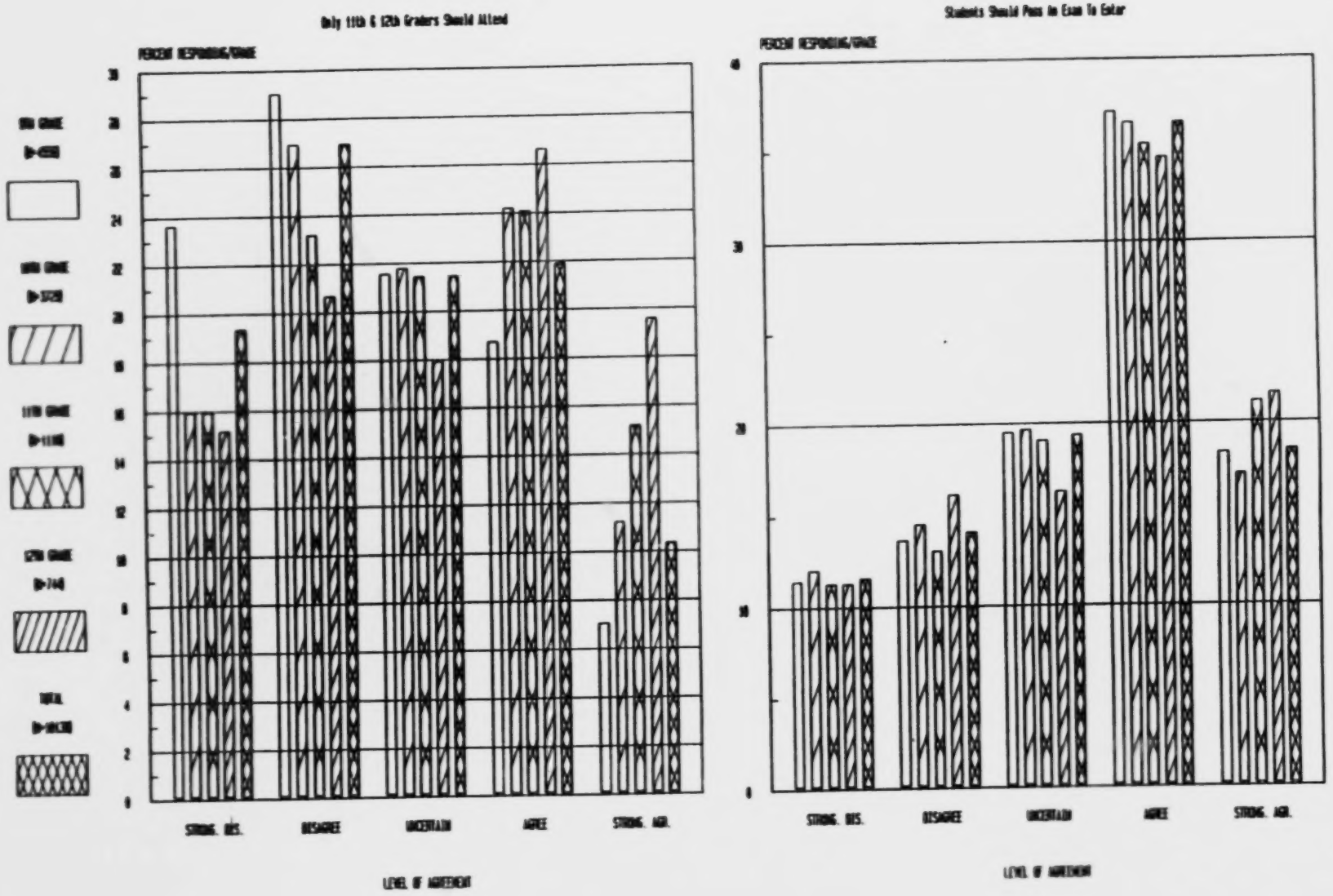

Only 11th & 12th Graders Should Attend
PERCENT RESPONDING/GRADE
LEVEL OF AGREEMENT
Students Should Pass An Exam To Enter
PERCENT RESPONDING/GRADE
LEVEL OF AGREEMENT

FIGURE 10
STUDENT OPINION
BY GRADE LEVEL

When considering whether a considerable part of each school day should be scheduled into science and technology laboratories, 60.5% agreed (6133) with close consistency across classes. Requiring all students to complete science projects was supported by only 31.9% of the respondents. Freshmen liked this idea least (46.2%), and for all classes more than one-third disagreed with such a requirement. See Figures 11 (page 20), 14, 15, & 16 (pages 23-25) for more detail.

The item with the least uncertainty (only 17.6% uncertain) on the part of all four classes dealt with having a longer school day. Only 14.8% supported such an idea and 67.6% thought that it was not a good idea. Freshmen and sophomores were equally disenchanted with the suggestion (68.4%) closely followed by seniors (65%) and juniors (63.8%). Spending part of that day however, outside of school in business and industry drew 43.6% agreement, 25.6% disagreement and 30.8% uncertainty. See Figures 12 (page 21), 14, 15, & 16 (pages 23-25) for more detail.

The statement soliciting the most agreement from all classes and in total dealt with the use of scientists and engineers as part-time teachers in the classroom. Nearly three-fourths (70.5%) of all respondents agreed with this statement (49.9% agree; 25.3% strongly agree). Only 11.3% disagreed with this statement and 18.2% were uncertain. Seniors supported this statement more than any other class (75.2%) with others very close (juniors 72.7%; sophomores 73.1%; and freshmen 67.2%). See Figures 13-16 (pages 22-25) for more detail.

College and Career Plans

Nearly 84.5% of all respondents replied "yes" to an inquiry concerning their intention to go to college: Freshmen (85.9%); Sophomores (81.6%); Juniors (88%); and Seniors (81.8%). Only 10.6% of all respondents were uncertain. Figure 17 (page 26) graphical displays these statistics. Figure 18 (page 27) breaks out responses by sex, by grade level and Figures 19-21 (pages 28-31) breaks out responses by race/ethnic group by grade.

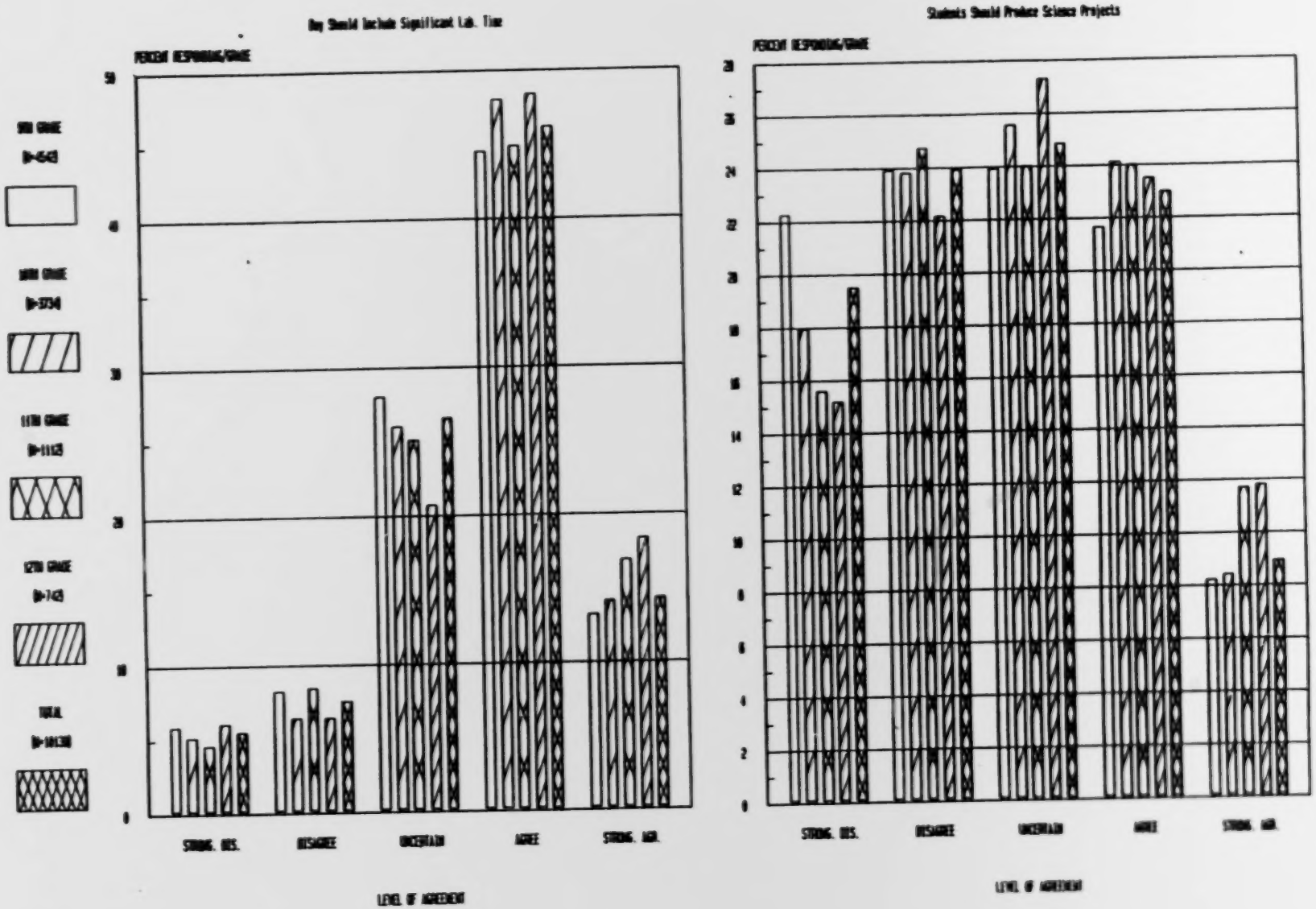


FIGURE 11
STUDENT OPINION
BY GRADE LEVEL

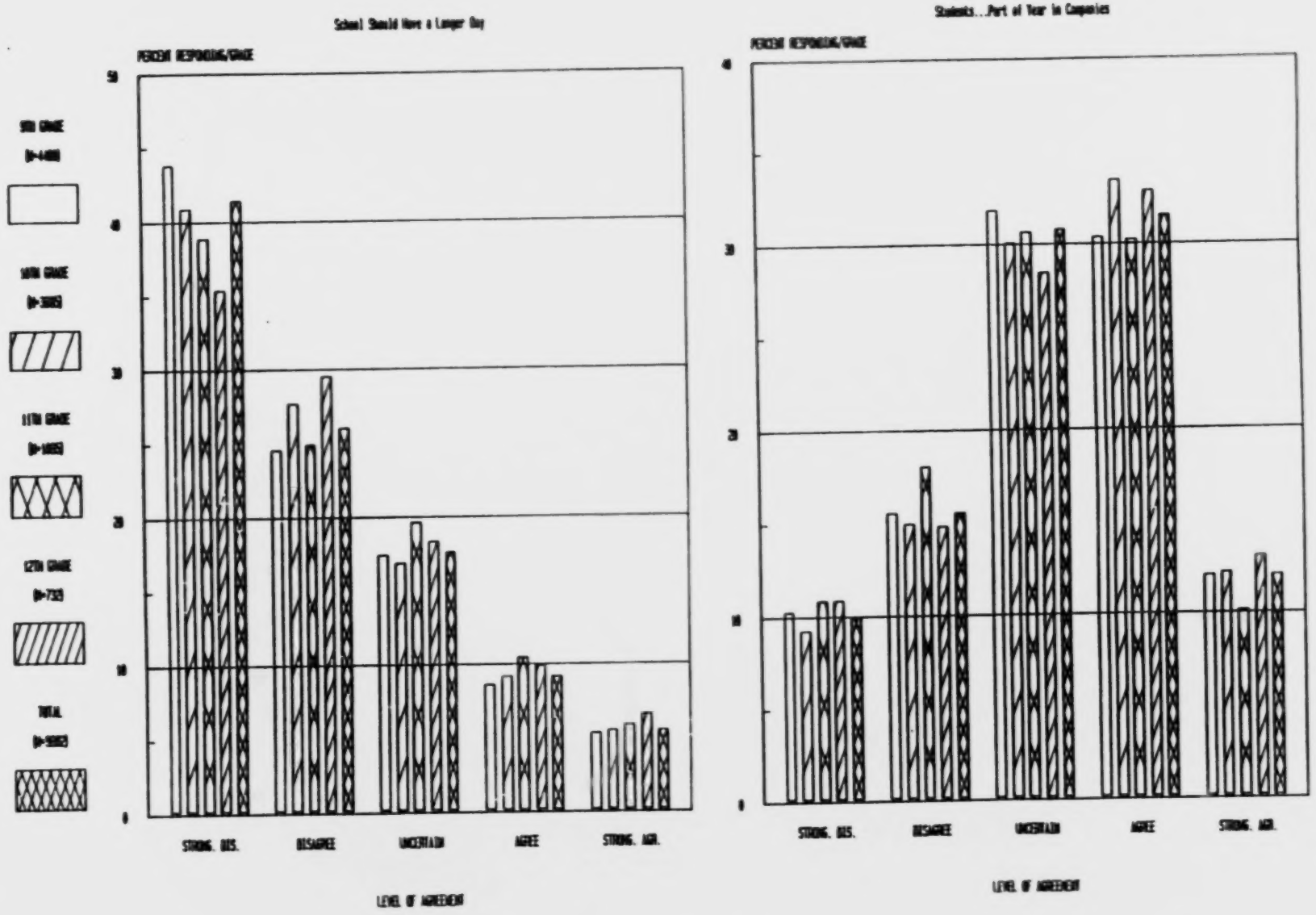


FIGURE 12
STUDENT OPINION
BY GRADE LEVEL

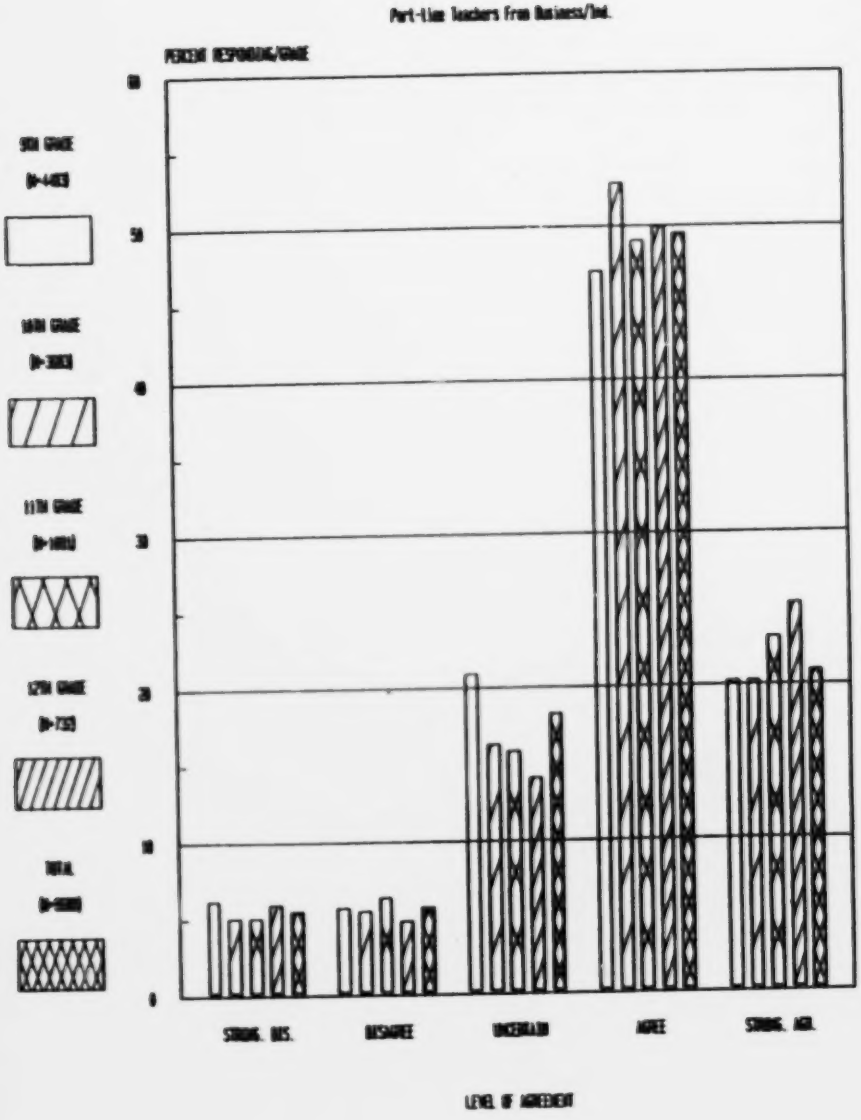


FIGURE 13
STUDENT OPINION
BY GRADE LEVEL

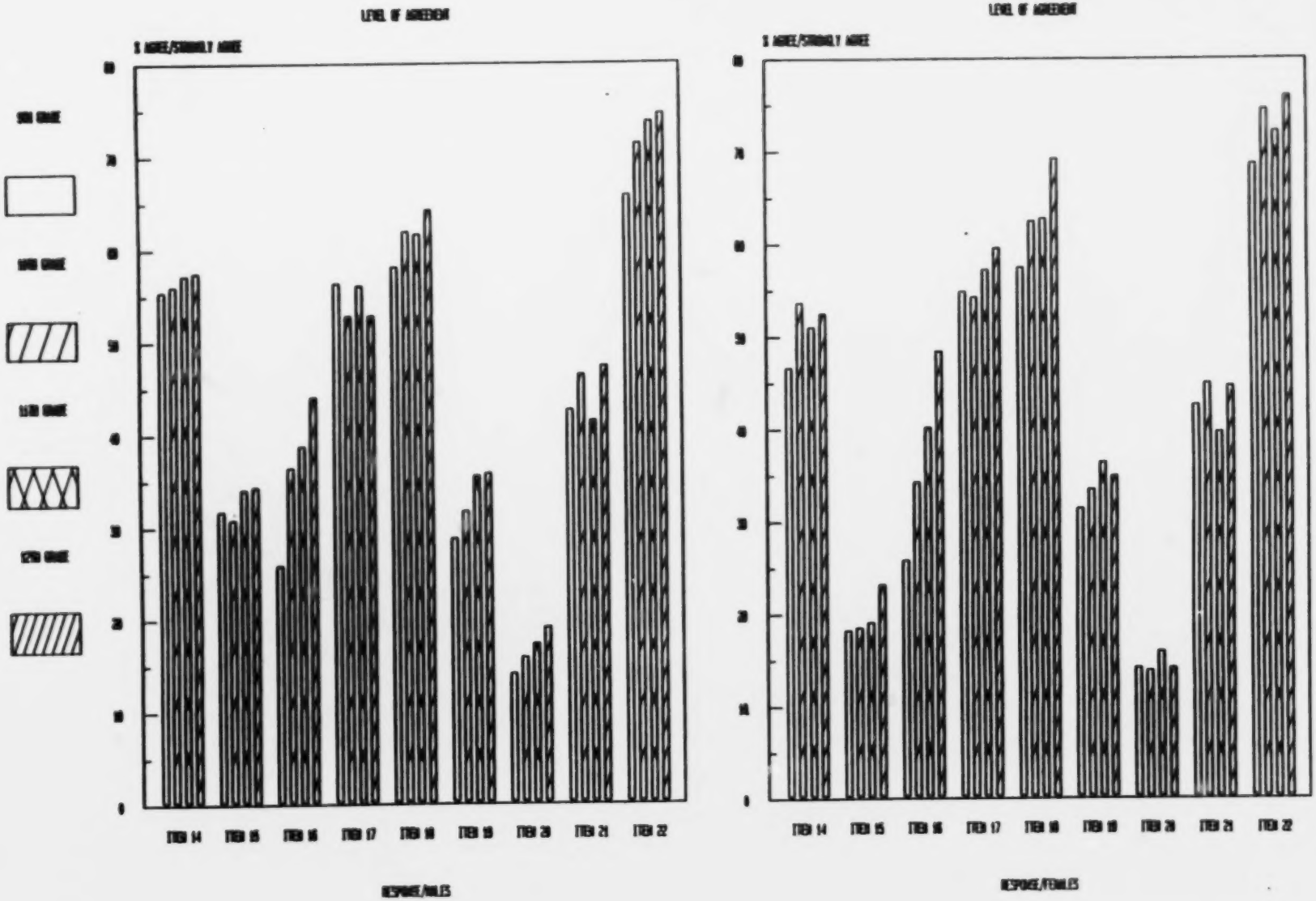


FIGURE 14
STUDENT OPINION
BY SEX

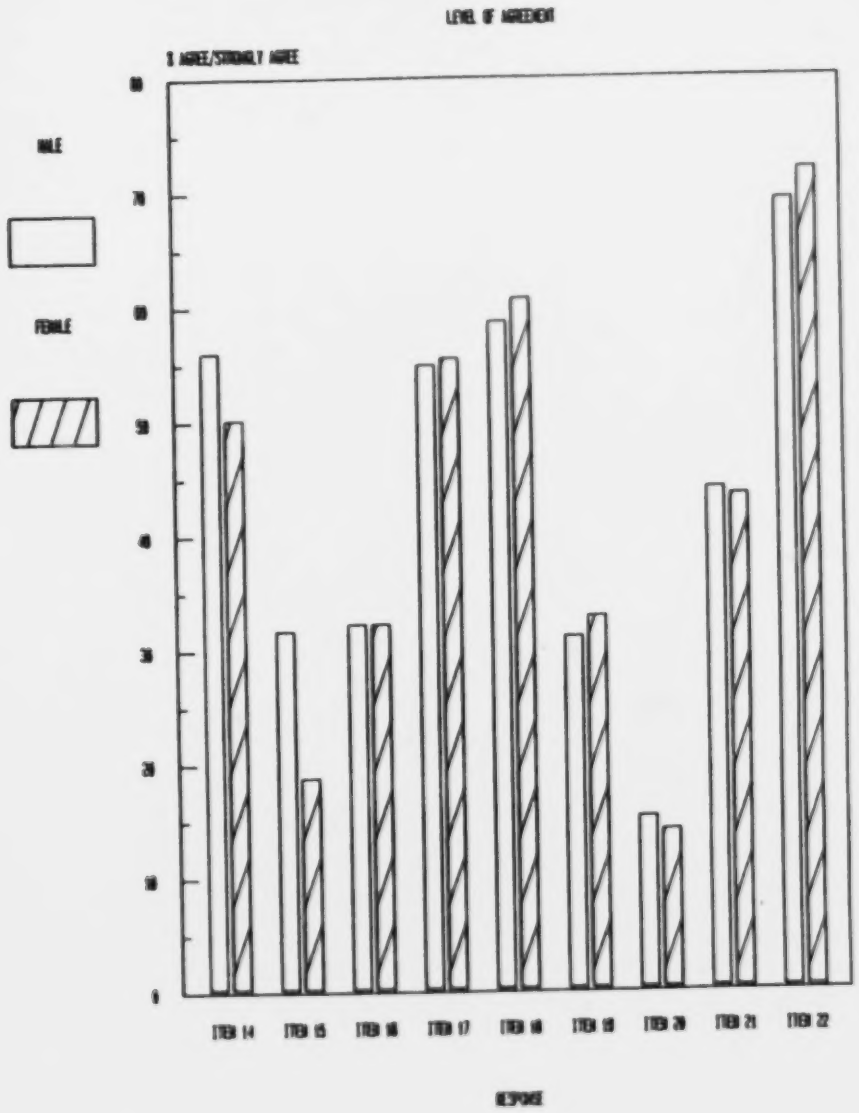
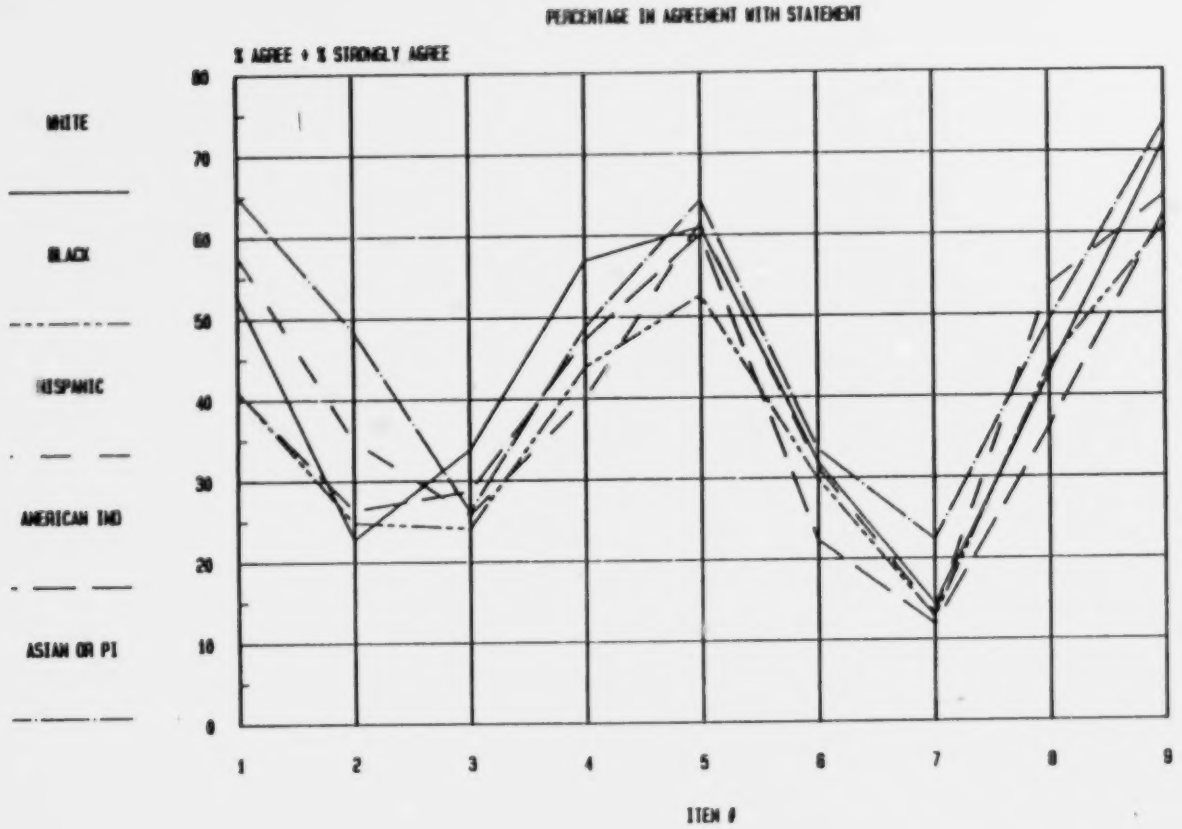


FIGURE 15
STUDENT OPINION
BY SEX



1 = FCPS SHOULD HAVE A SCHOOL FOR S&T
2 = I WOULD BE INTERESTED IN ATTENDING
3 = ONLY 11TH & 12TH GRADE SHOULD ATTEND
4 = STUDENTS SHOULD PASS AN EXAM TO ENTER
5 = DAY SHOULD INCLUDE SIGNIFICANT LAB TIME
6 = STUDENTS SHOULD PRODUCE SCIENCE PROJECTS
7 = SCHOOL SHOULD HAVE A LONGER DAY
8 = STUDENTS...PART OF YEAR IN COMPANIES
9 = PART-TIME TEACHERS FROM BUSINESS/IND.

FIGURE 16
STUDENT OPINION
BY RACE/ETHNIC GROUP

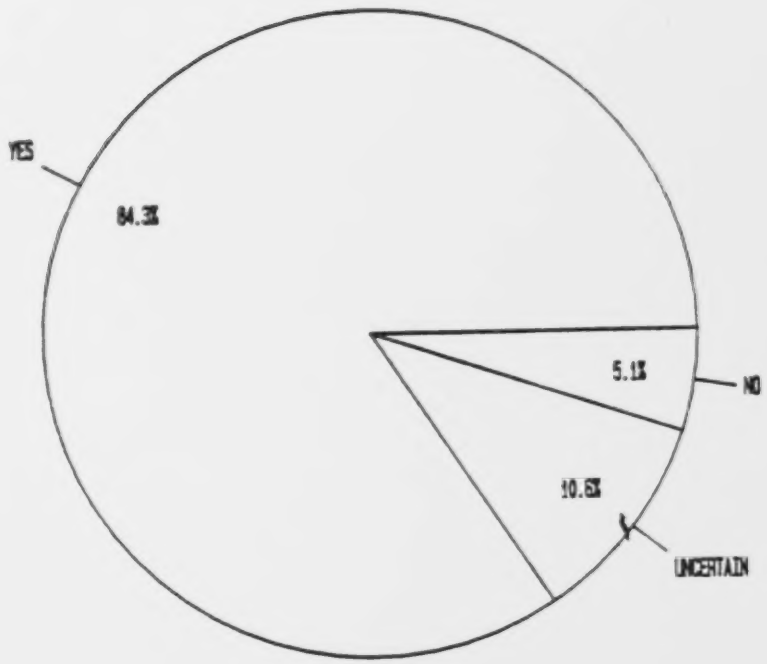


FIGURE 17
INTENTION TO ATTEND COLLEGE

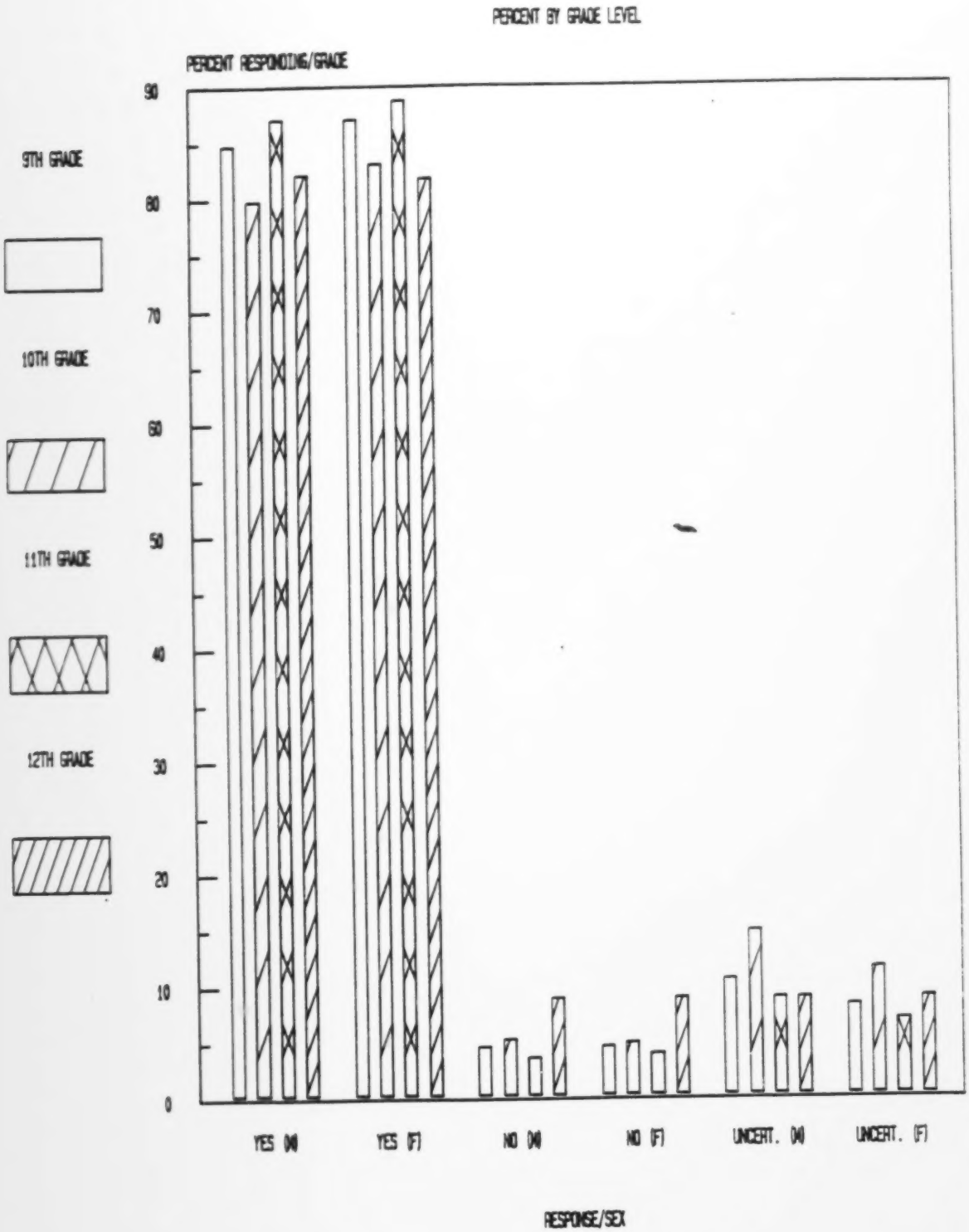


FIGURE 18
INTENTION TO ATTEND COLLEGE BY SEX BY GRADE

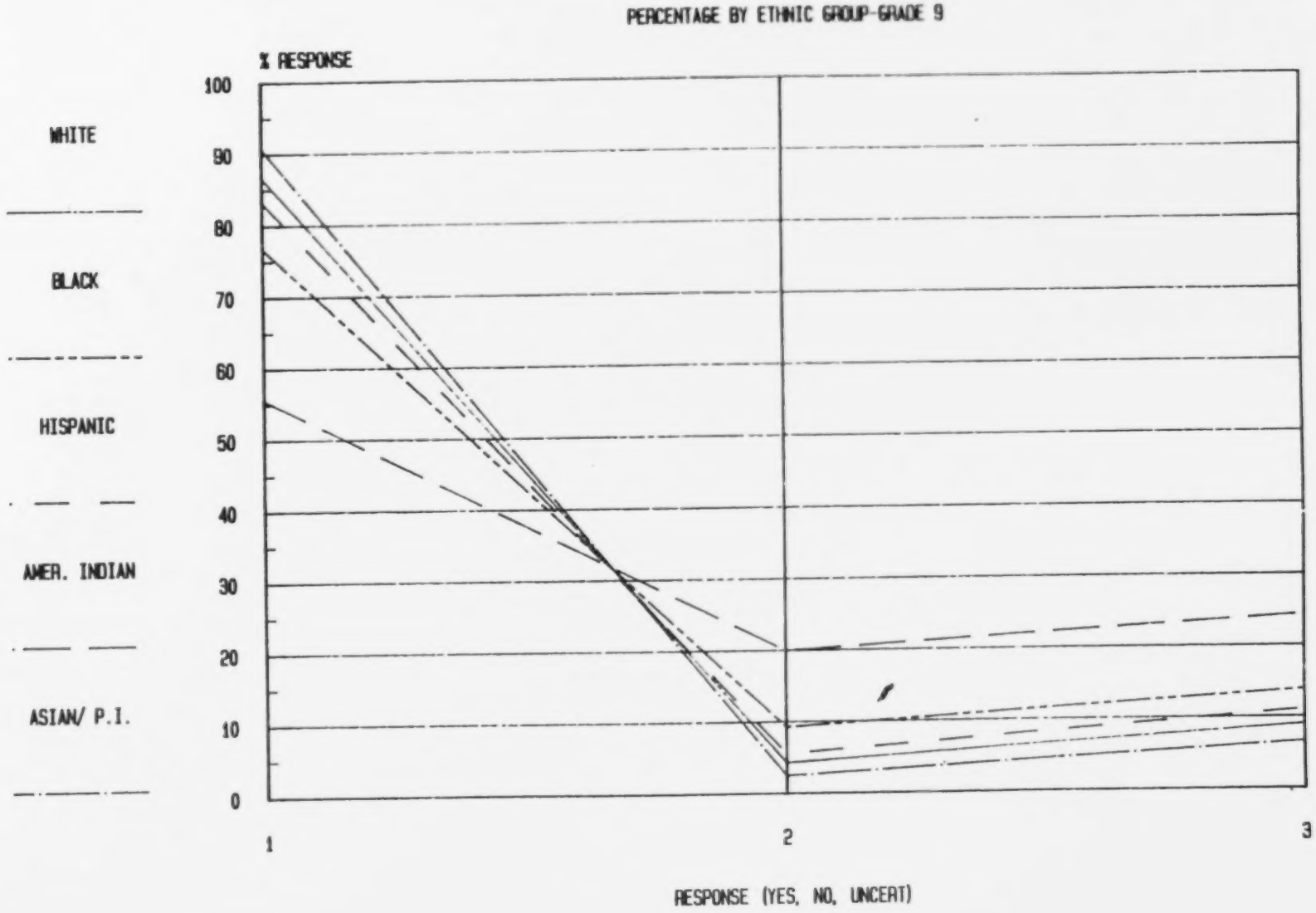


FIGURE 19
INTENTION TO ATTEND COLLEGE BY RACE/ETHNIC GROUP
GRADE NINE

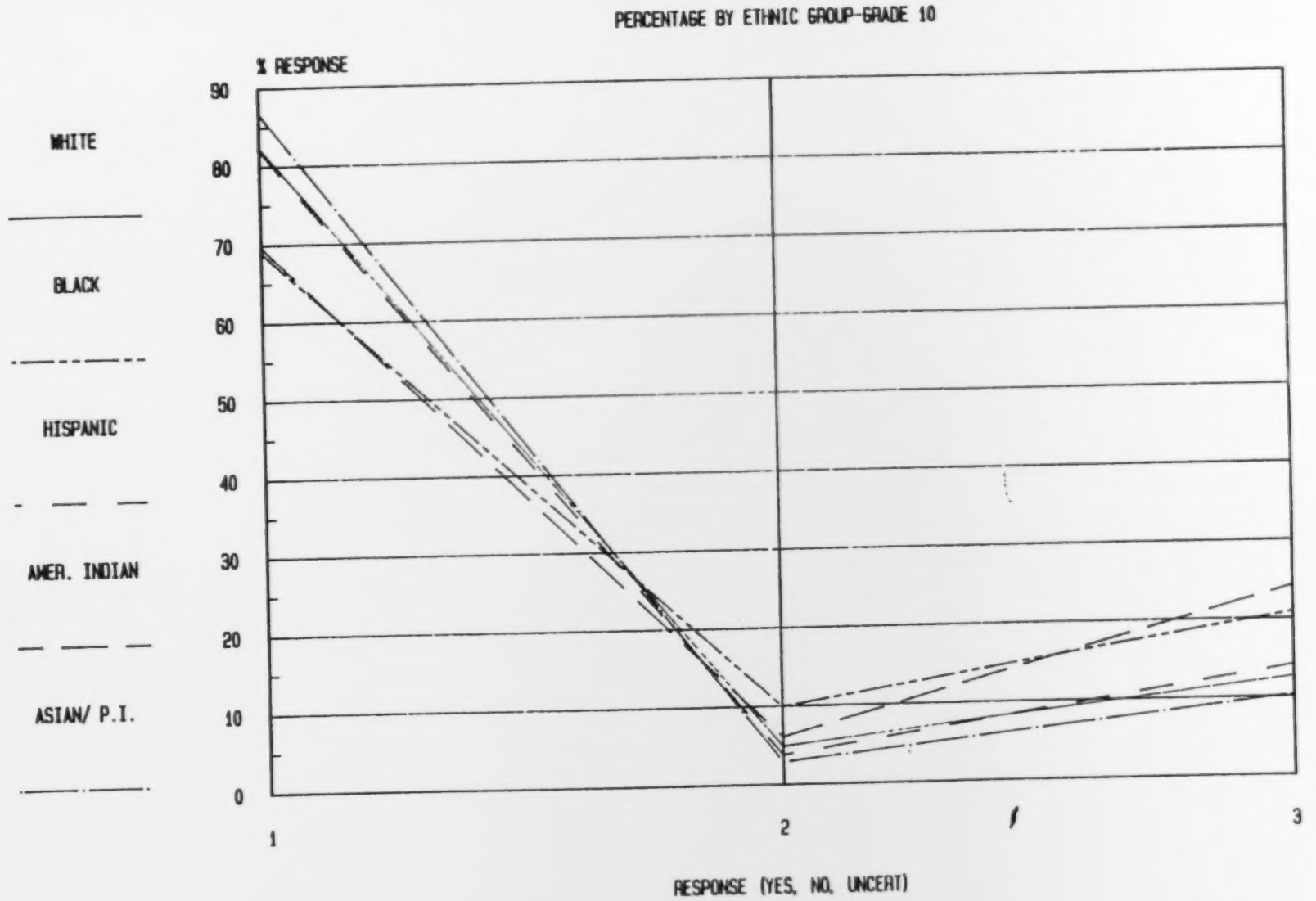


FIGURE 20
INTENTION TO ATTEND COLLEGE BY RACE/ETHNIC GROUP
GRADE TEN

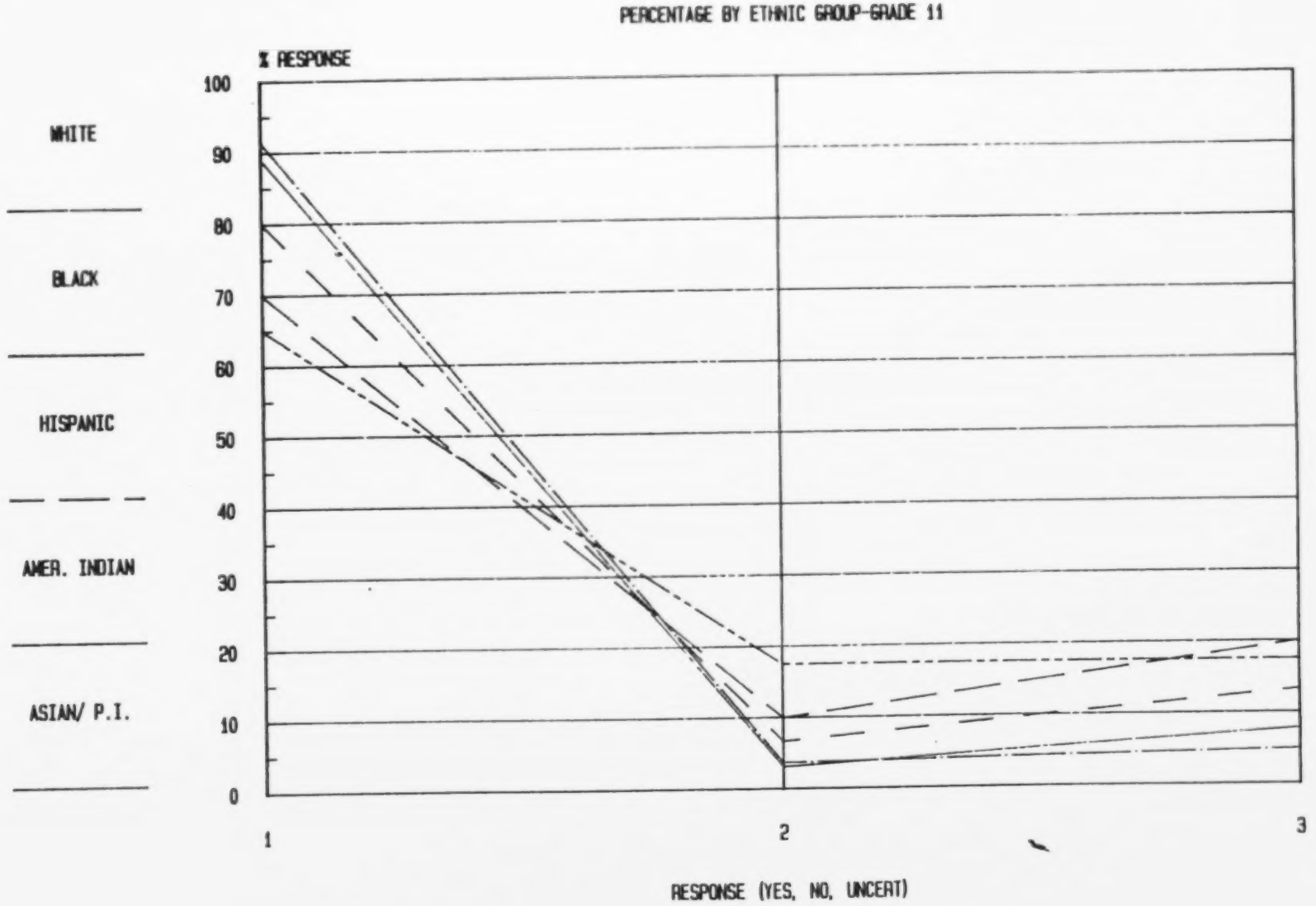


FIGURE 21
INTENTION TO ATTEND COLLEGE BY RACE/ETHNIC GROUP
GRADE ELEVEN

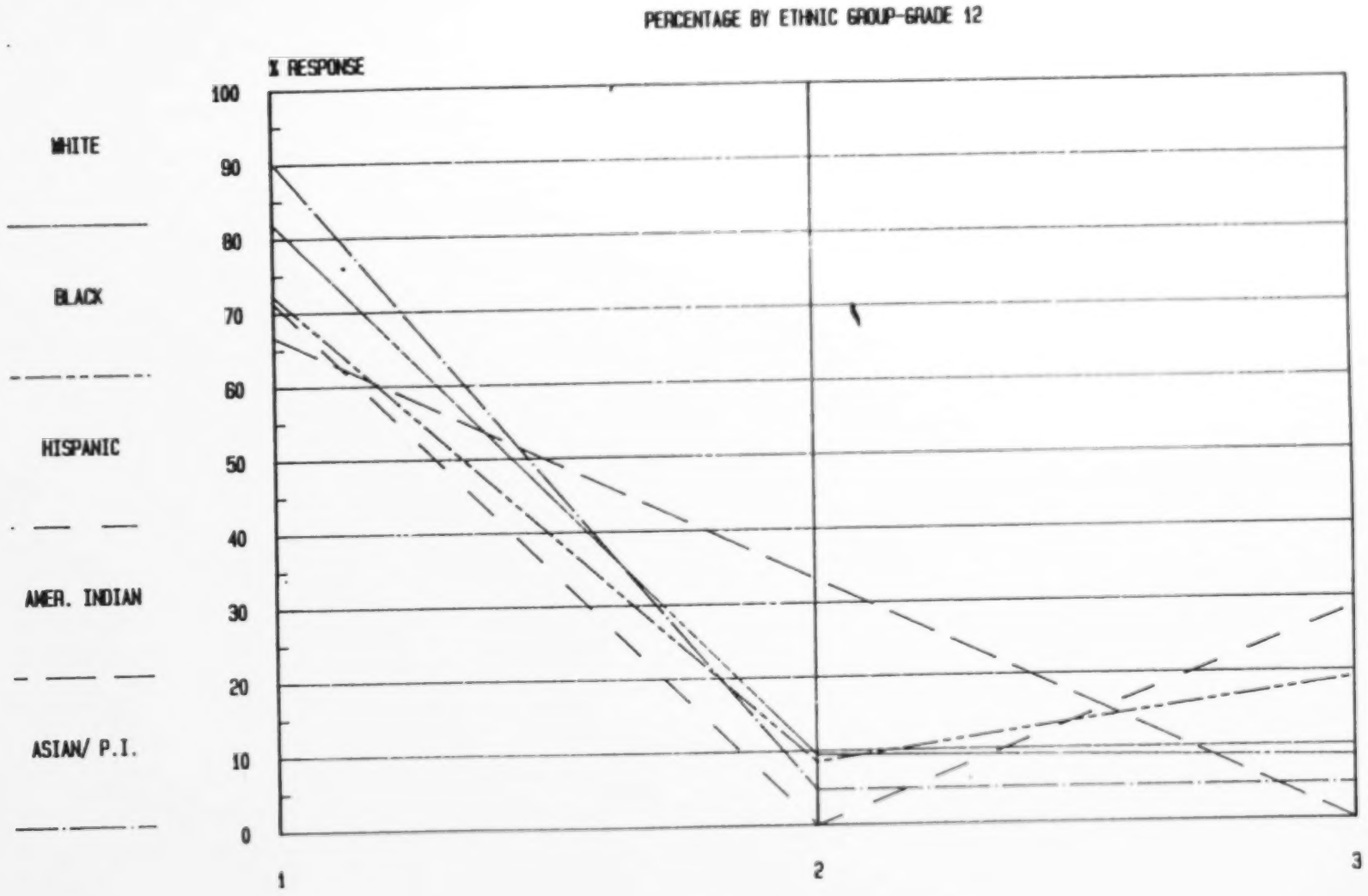


FIGURE 22
INTENTION TO ATTEND COLLEGE BY RACE/ETHNIC GROUP
GRADE TWELVE

Roughly one-third of each class expressed that they were intending to pursue a career in science, engineering or technology (32.5% freshmen; 31.7% sophomore; 37.1% junior; 35.7% senior); one-third responded "no" and one-third were uncertain (see Figure 23). Figure 24 (page 34) and Figure 25 (page 35) reports these data by sex and by race/ethnic group respectively.

Of the 9989 who responded to the question about expected major in college, 81 (.8%) reported Biology; 25 (.3%) Physics; 13 (.1%) Chemistry; 52 (.5%) other science; 1548 (15.5%) computer science; 1298 (13%) mathematics; 1675 (16.8%) engineering; 1264 (12.7%) other technical fields; and 3926 (39.3%) as not math, science or technology. Figure 26 (page 36) reports these data in total, and by sex. Figures 27-30 (pages 37-40) reports these data by race/ethnic group by grade.

Anticipated Applications for the School for Science & Technology

When asked if they would have applied for the school for science and technology if it were open this year, 20.3% responded yes; 48.5% responded no; and 32.2% were uncertain. Seniors responded yes most frequently (28.9%), followed by juniors (23%); then freshmen (19.6%) and sophomores (18.7%). Uncertainty ranged in decreasing order from freshmen (33.3%) to seniors (20.2%). Figures 31-33 (pages 41-43) present the data by grade, by sex and by ethnic group respectively.

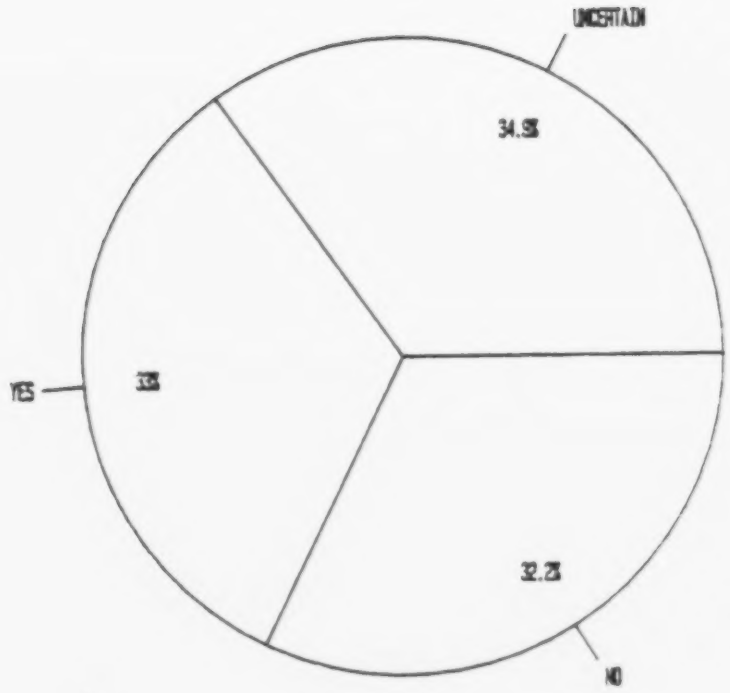


FIGURE 23
CAREERS IN SCIENCE, MATH OR TECHNOLOGY

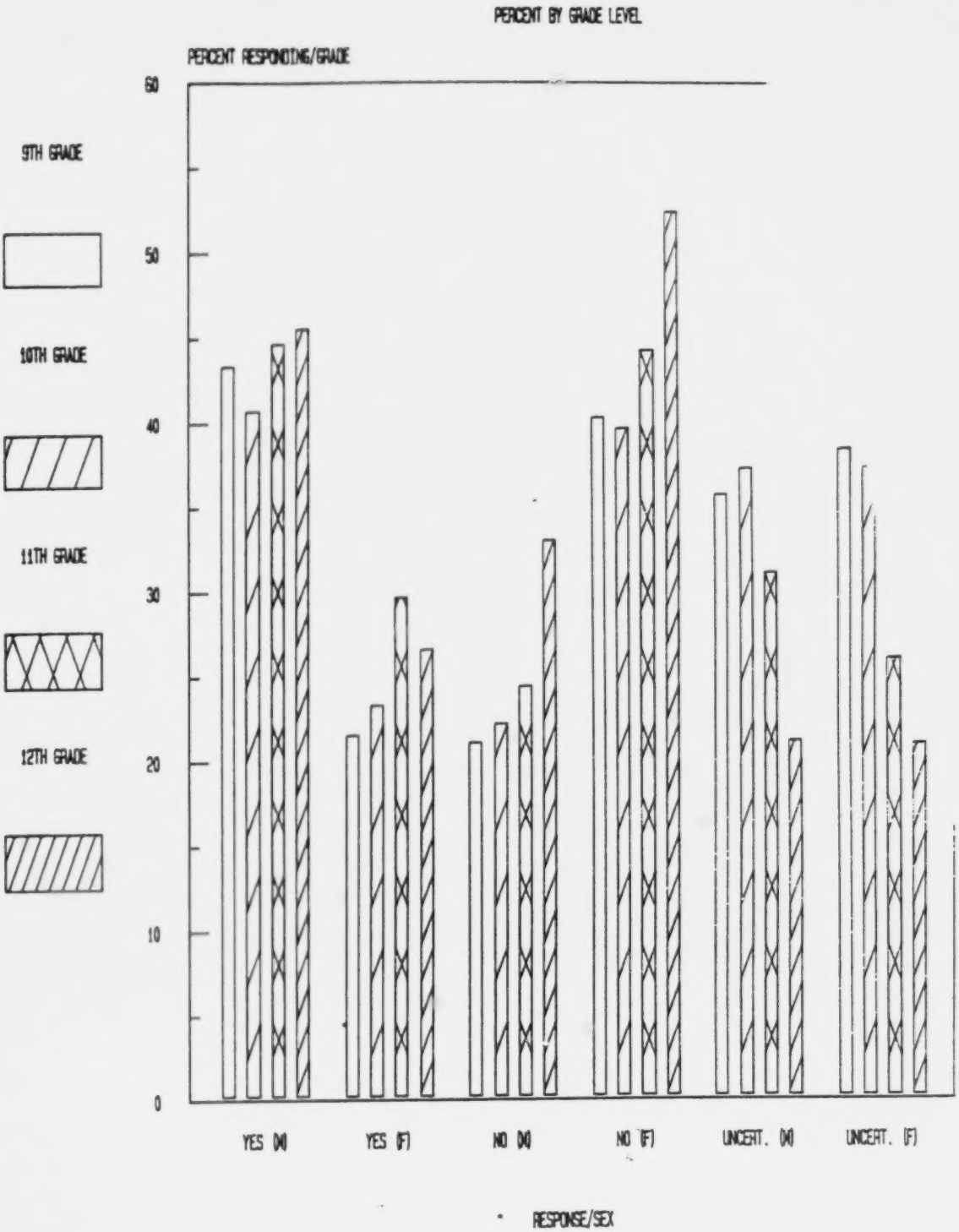


FIGURE 24
CAREERS IN SCIENCE, MATH OR TECHNOLOGY
BY SEX

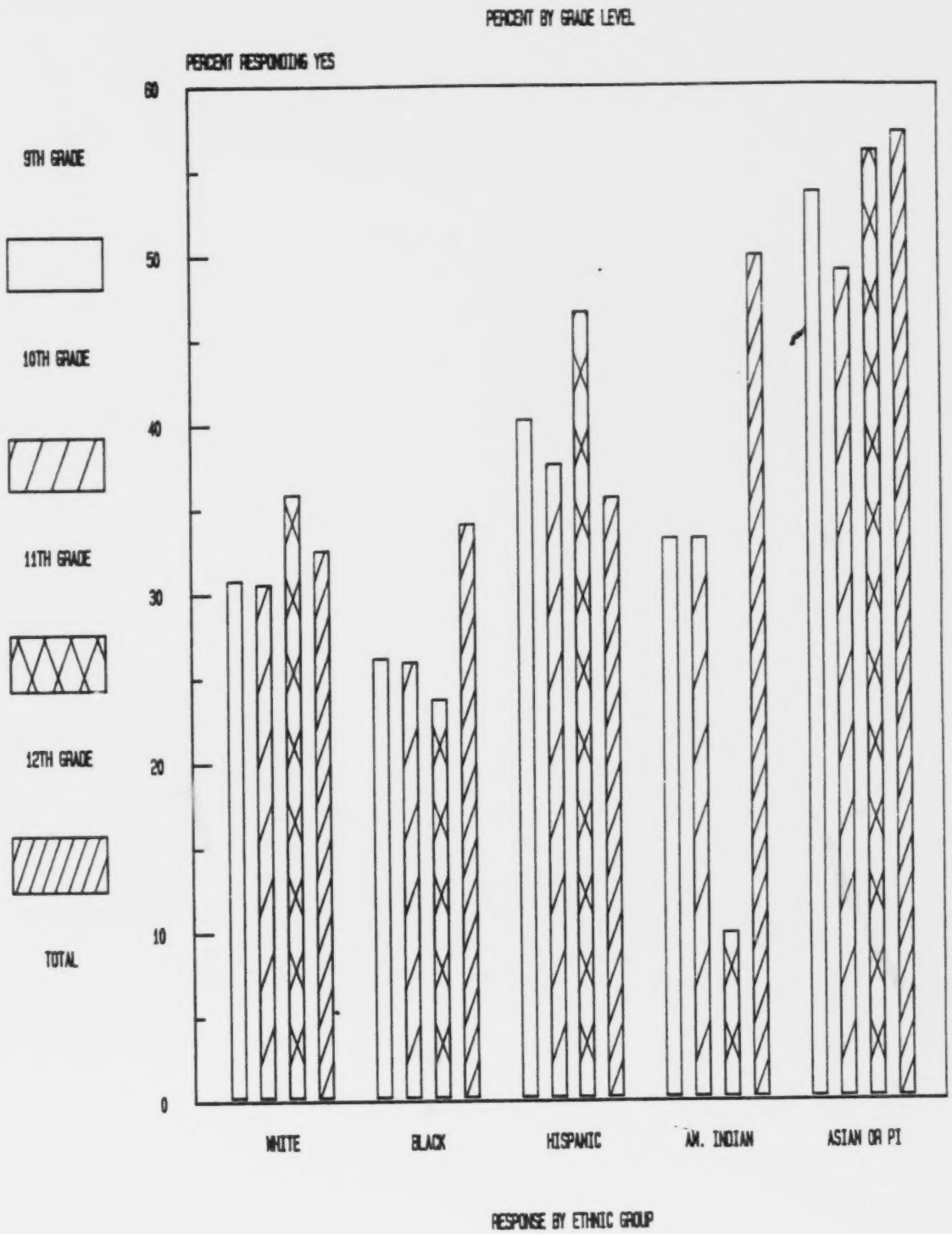
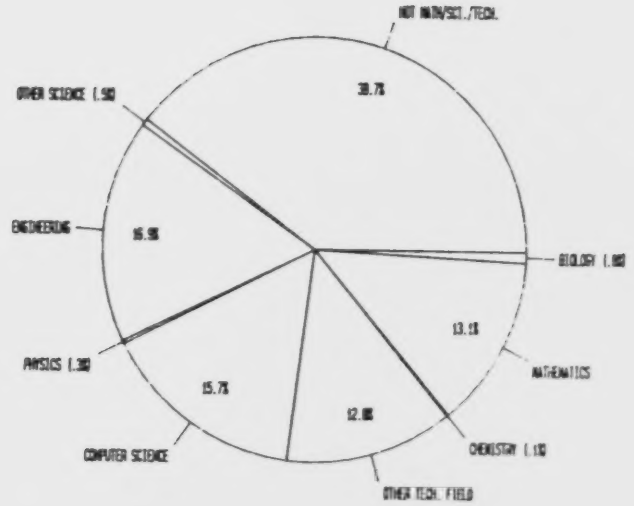
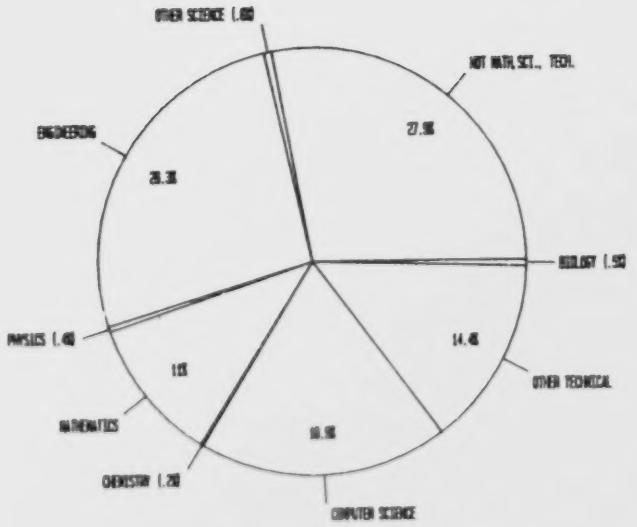


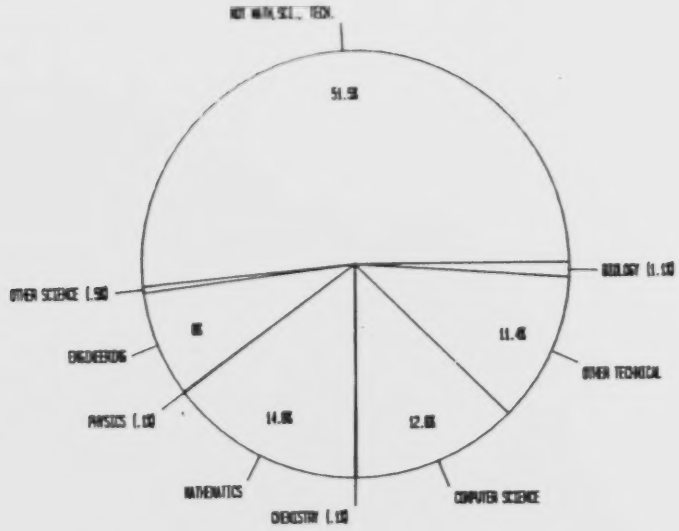
FIGURE 25
CAREERS IN SCIENCE, MATH OR TECHNOLOGY
BY RACE/ETHNIC GROUP



TOTAL



MALES



FEMALES

FIGURE 26
EXPECTED COLLEGE MAJORS
BY TOTAL, BY MALES & BY FEMALES

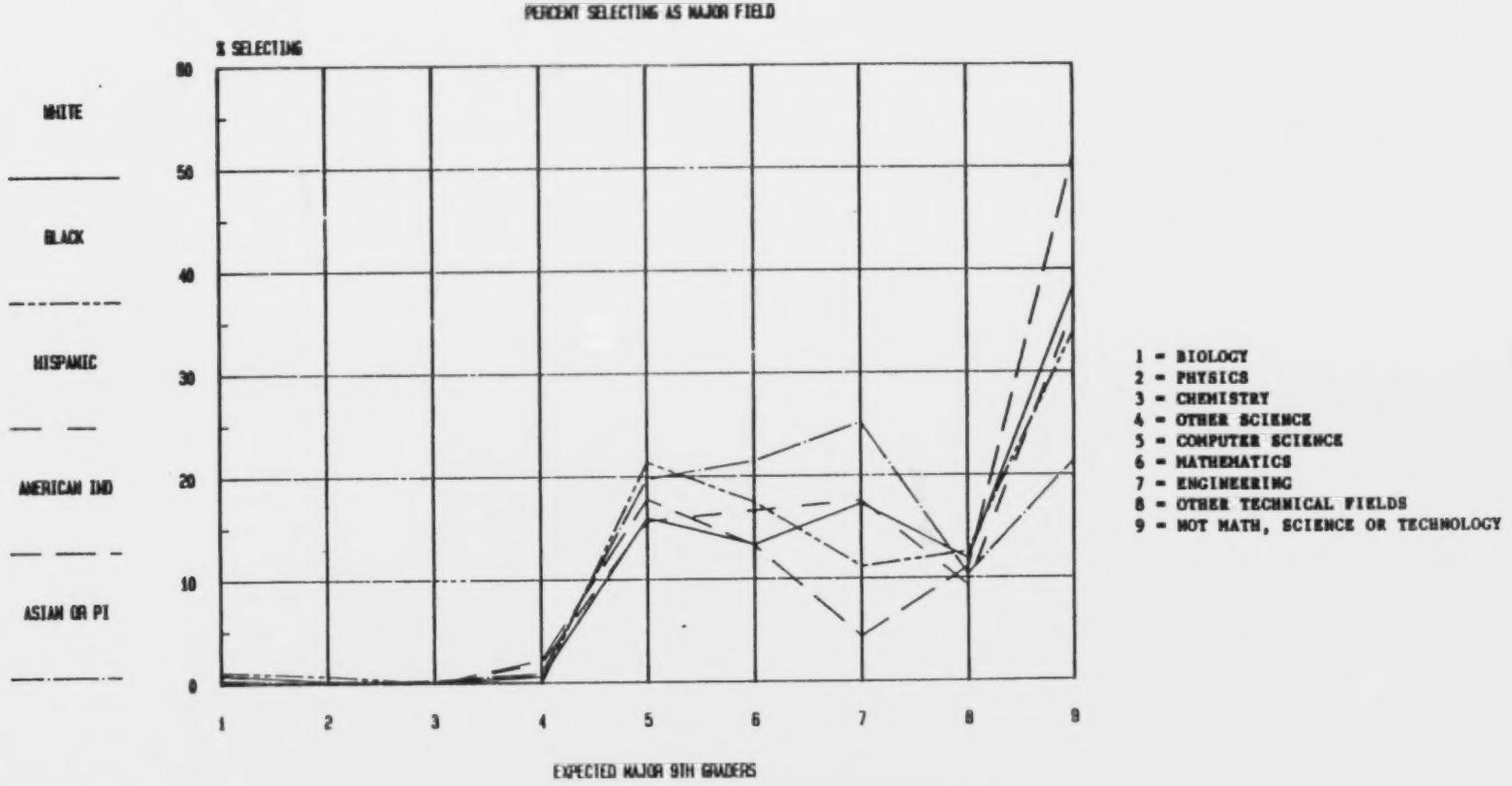


FIGURE 27
EXPECTED COLLEGE MAJORS
BY RACE/ETHNIC GROUP---GRADE 9

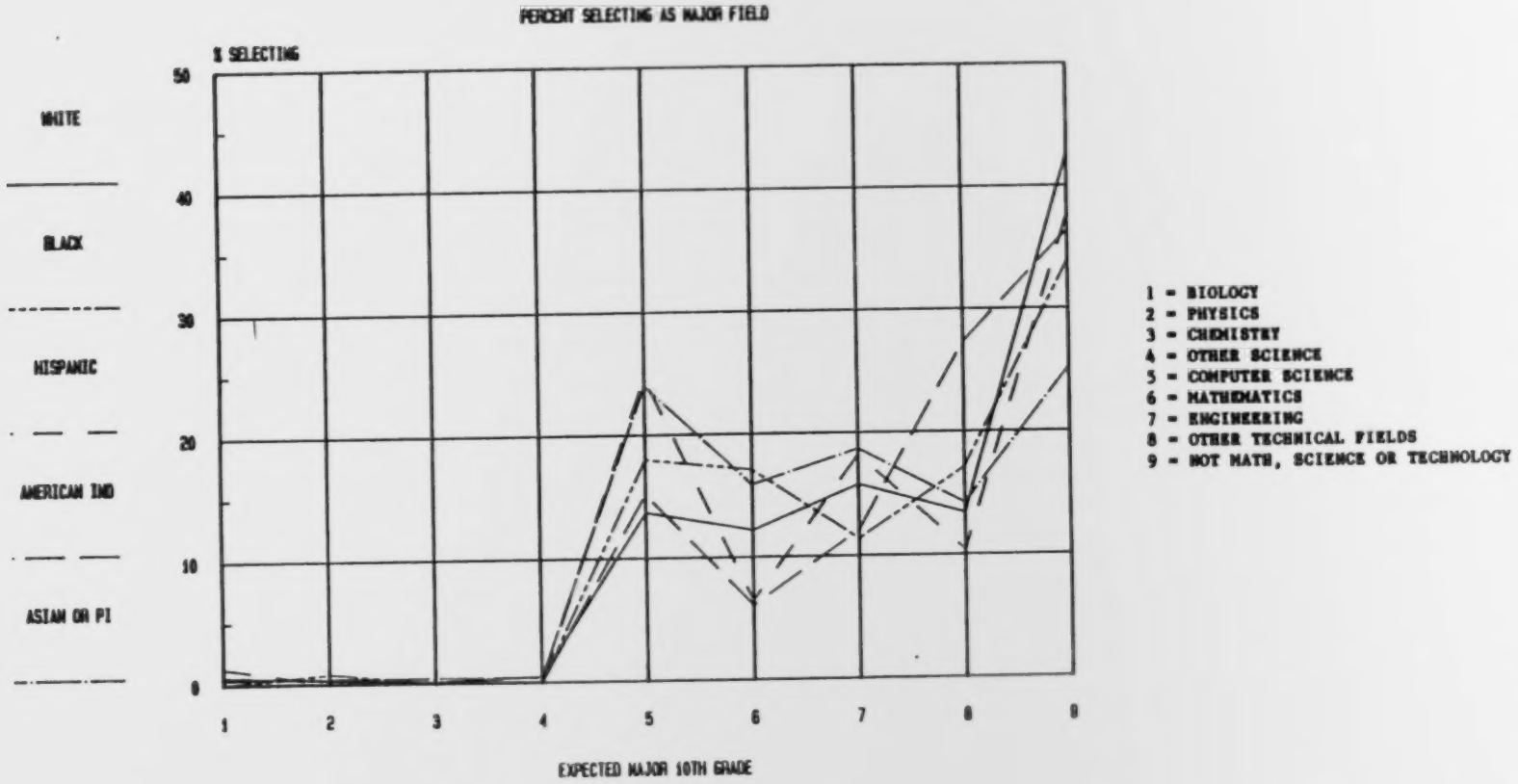


FIGURE 28
EXPECTED COLLEGE MAJORS
BY RACE/ETHNIC GROUP--GRADE 10

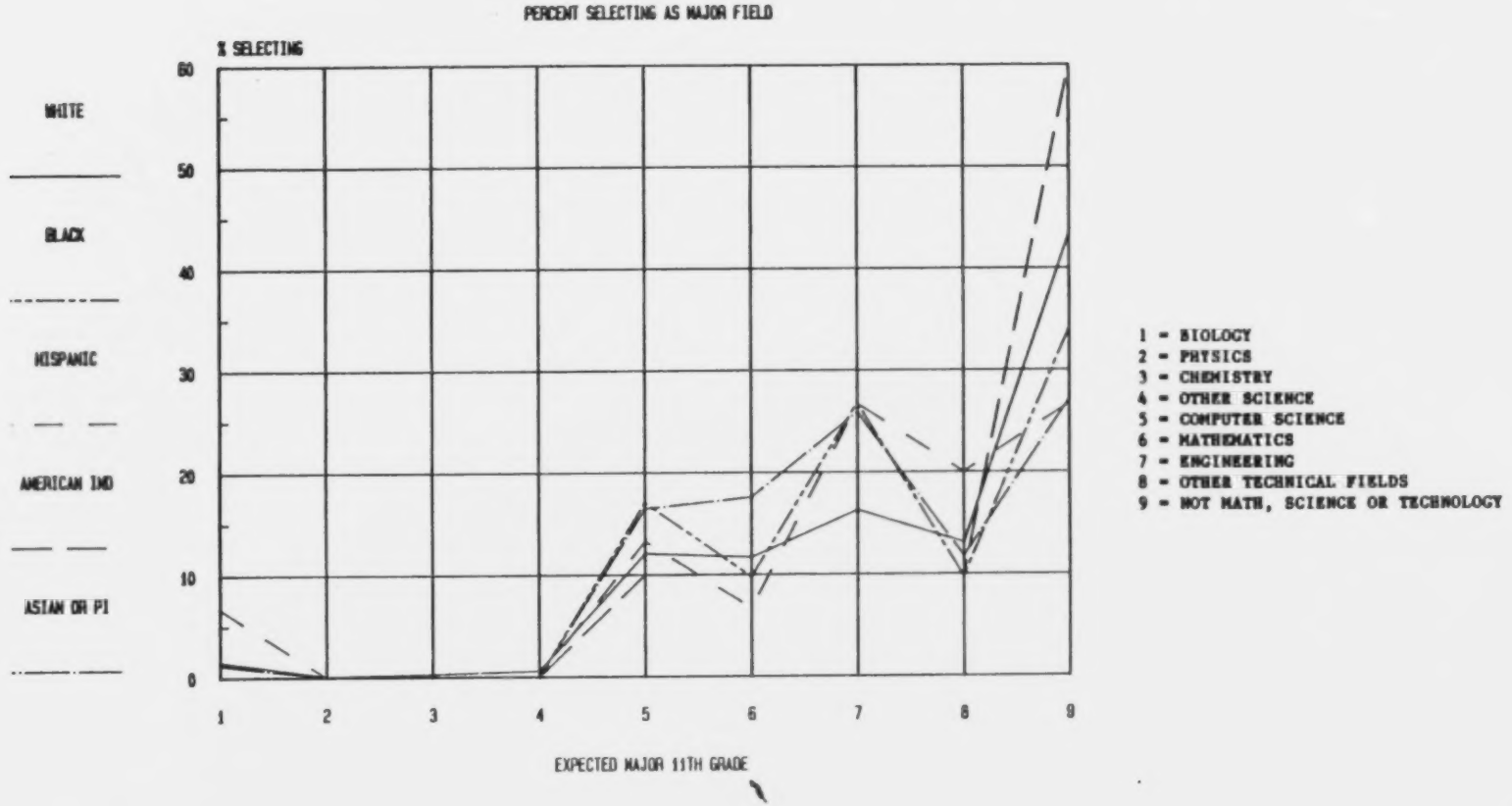


FIGURE 29
EXPECTED COLLEGE MAJORS
BY RACE/ETHNIC GROUP--GRADE 11

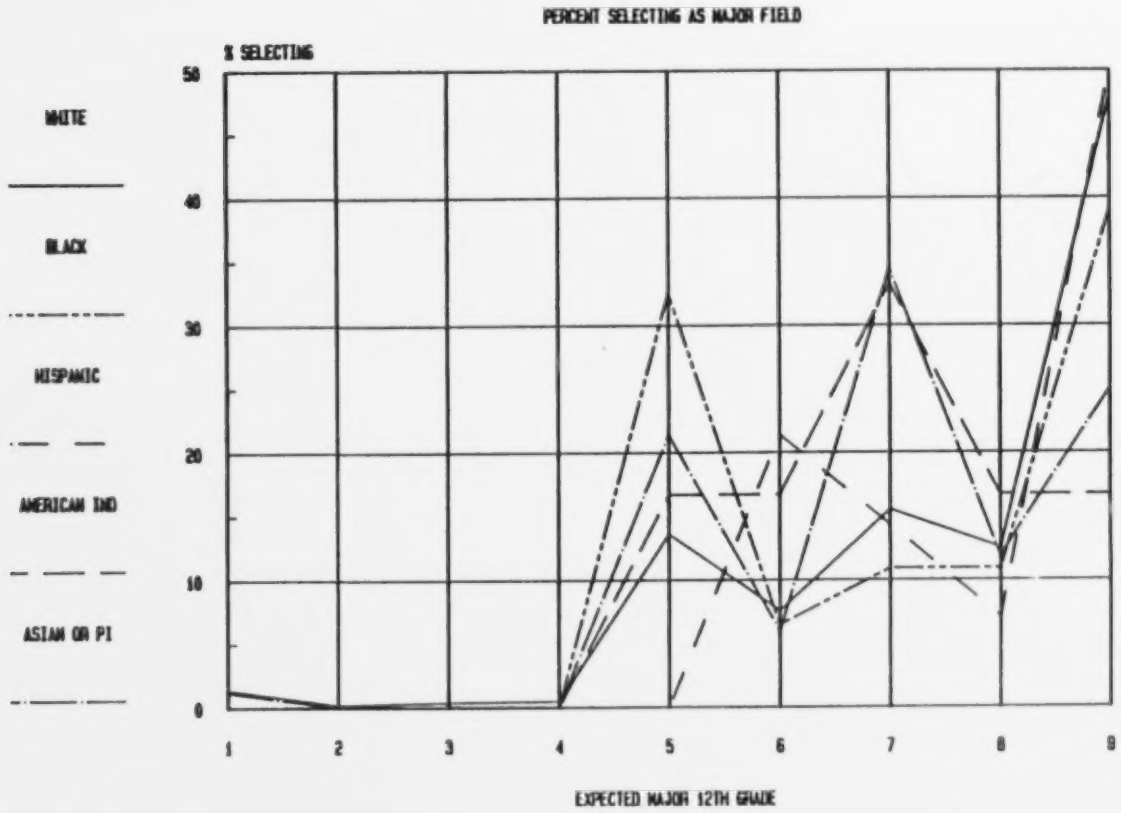


FIGURE 30
EXPECTED COLLEGE MAJORS
BY RACE/ETHNIC GROUP--GRADE 12

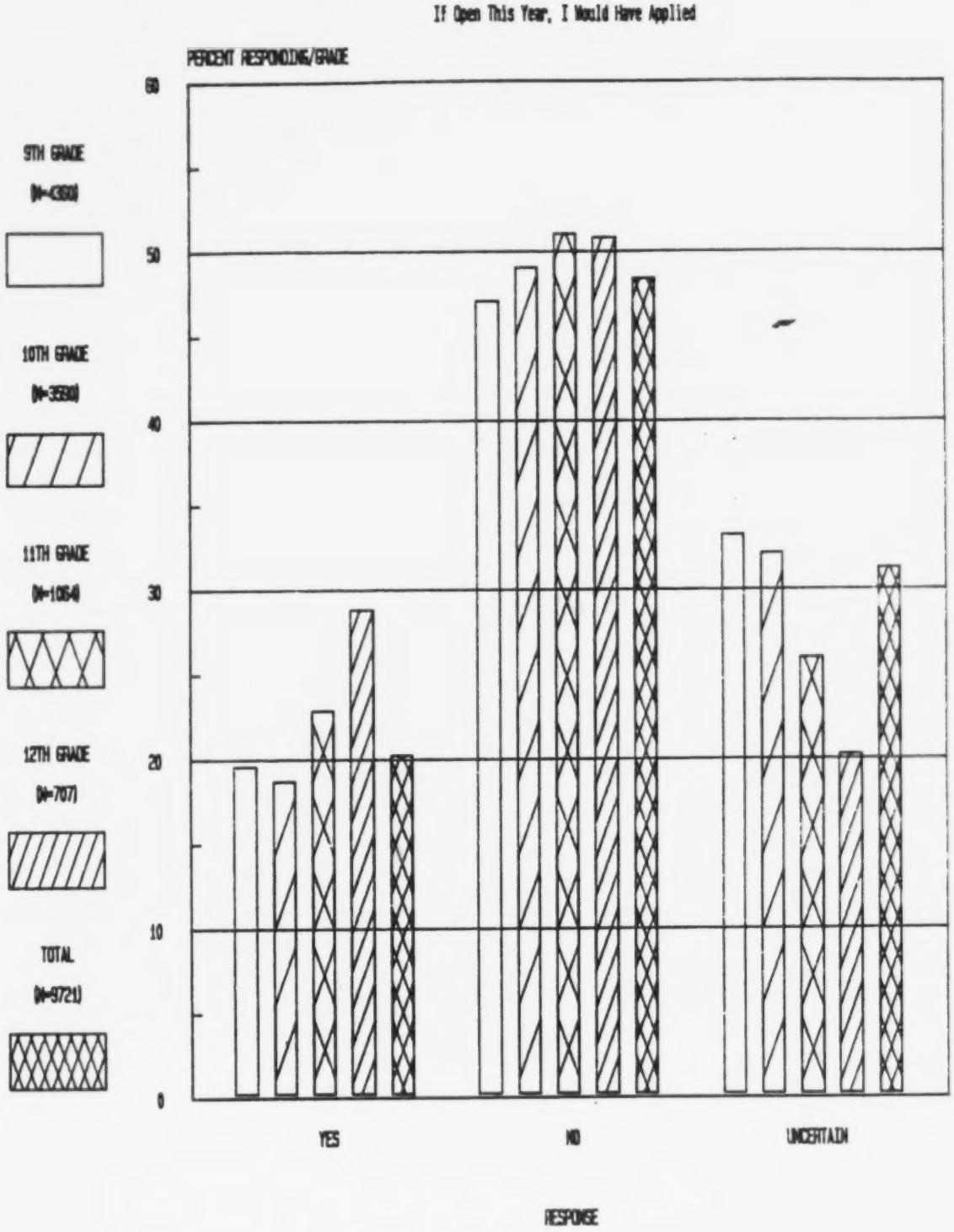


FIGURE 31
WOULD HAVE APPLIED THIS YEAR--BY GRADE

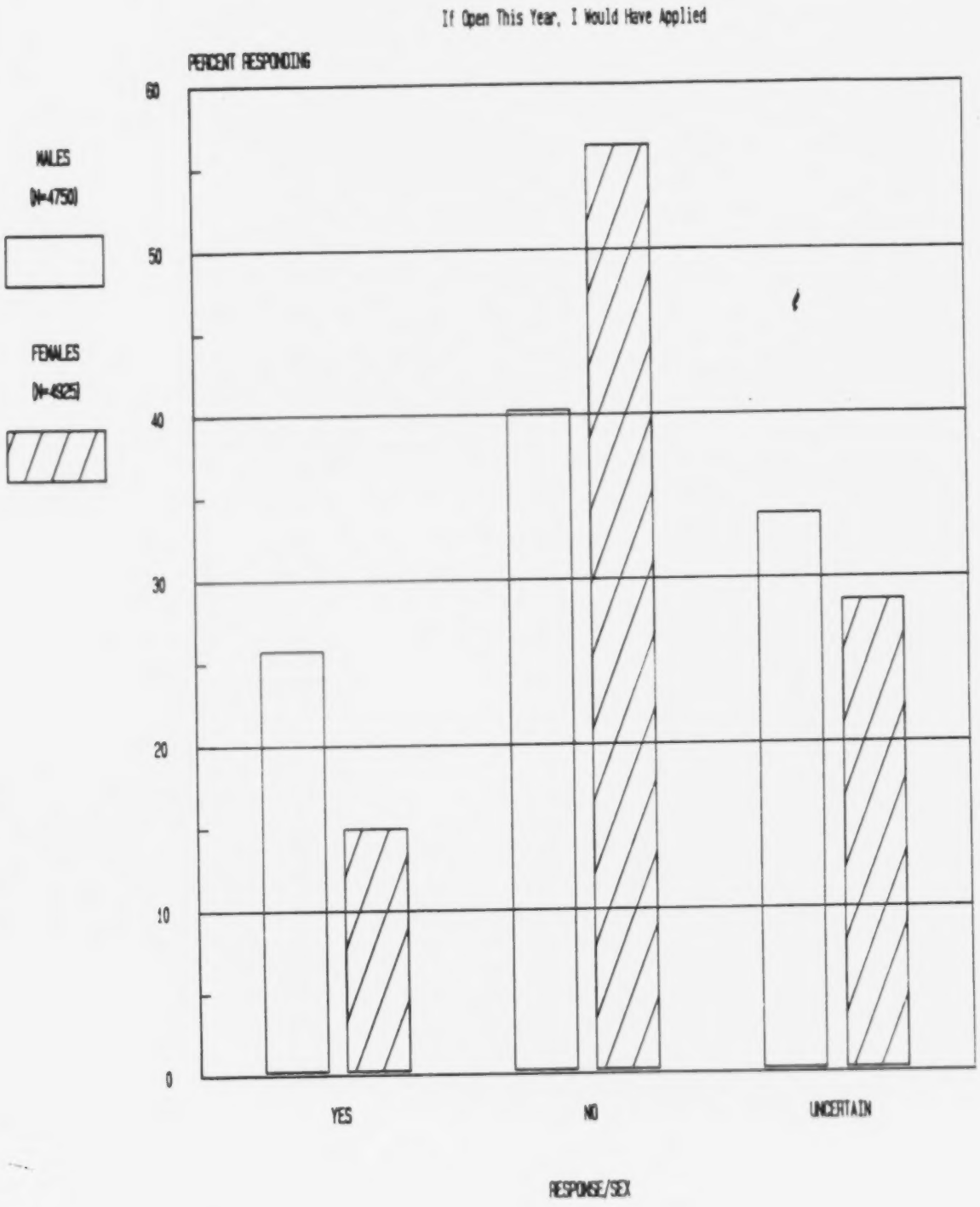


FIGURE 32
WOULD HAVE APPLIED THIS YEAR--BY SEX

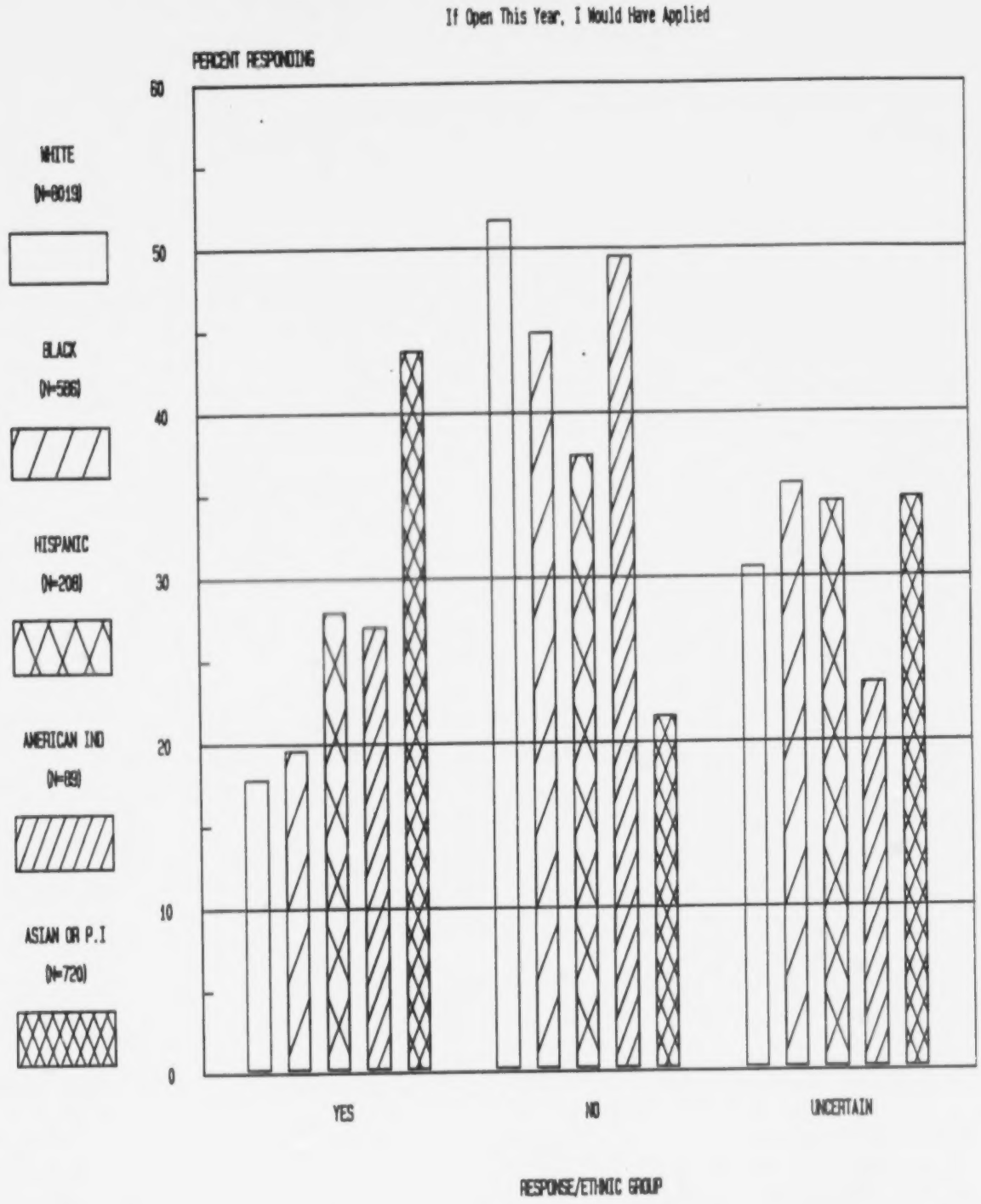


FIGURE 33
WOULD HAVE APPLIED THIS YEAR--BY RACE/ETHNIC GROUP

Fairfax County Public Schools
School For Science and Technology
Student Questionnaire

Directions for Survey Administration

Please read the program description below before administering the survey.

INTRODUCTION AND PROGRAM DESCRIPTION

Fairfax County Public Schools (FCPS) is planning a school for science and technology to open in September 1985 for eleventh and twelfth grade students. We want to get your opinions about this school. For some of you, this school may be particularly appropriate and interesting. It will take only a few minutes for me to describe the school and about ten minutes for you to answer some questions to help us with our planning.

Before having you complete the questionnaire, let me briefly describe the school and program.

Fairfax County Public Schools is considering a special high school in which science, mathematics, and technology are to be emphasized. We have recommended that the school be located at Annandale High School which is central to the county. Transportation will be provided. The school will be for eleventh and twelfth grade students, and students would attend the school all day.

The science and technology program will permit students to study with teachers from the school system and from business and industry. The school is being designed to serve students who expect to go on to college and major in science, mathematics, engineering, and related fields. In addition, students will be expected to demonstrate evidence of an aptitude and/or achievement in mathematics and science.

The school will include several laboratories to support instruction in mathematics, science, and technology to enable students to complete exercises and assignments, and to conduct experimentation using a wide variety of equipment. Laboratories being proposed include those in such areas as robotics, telecommunications, energy, computers, and electronics in addition to science laboratories for biology, physics, and chemistry. Of course the school will also include all other coursework required for graduation from high school (arts, music, humanities, foreign language, etc.) and extracurricular opportunities for student participation.

In order to help us do a better job of planning this school, we need to find out from you, the students, what you think of this idea and if you might be interested in participating in a program of this type. Your answers will be used only to help us with our planning and will have no effect on whether you would be enrolling in the school.

Your participation in helping us gain accurate information is voluntary, and your answers will be kept completely confidential. We hope you will choose to help us by completing the form.

Fairfax County Public Schools
Survey Concerning the Proposed School For Science and Technology
Student Questionnaire

DIRECTIONS: All answers are to be coded on the answer sheet provided. For each question, use a pencil to shade the letter on the answer sheet that corresponds to the letter next to your answer. Shade **ONLY** one answer for **EACH** question. Your responses will remain anonymous. **DO NOT** put your name on either the questionnaire **OR** the answer sheet.

1. What is your grade level?

   A. Ninth
   B. Tenth
   C. Eleventh
   D. Twelfth

2. Are you male or female?

   A. Male
   B. Female

3. Which category would you use to describe yourself?

   A. White
   B. Black
   C. Hispanic
   D. American Indian
   E. Asian or Pacific Islander

Are you participating in any of the school sponsored extracurricular activities listed below:

4.	Band	A. Yes	B. No
5.	Orchestra	A. Yes	B. No
6.	Chorus	A. Yes	B. No
7.	Athletics	A. Yes	B. No
8.	Drama	A. Yes	B. No
9.	Others	A. Yes	B. No

For numbers 10 through 13, use the four choices below to indicate how much each statement might **discourage** you from attending the school.

A. Would definitely discourage me
B. Might discourage me
C. Would not discourage me
D. Not sure

10. The possibility of having to travel by school bus from my neighborhood to the school.
11. The possibility of having fewer extracurricular activities available to me.
12. The possibility of having fewer elective courses from which to choose.
13. The possibility of having to leave my friends at the high school I now attend.

For numbers 14 through 22, use the choices below to indicate how strongly you agree or disagree with each statement.

A. Strongly disagree
B. Disagree
C. Uncertain
D. Agree
E. Strongly agree

14. Fairfax County Public Schools should have a school for science and technology.
15. I would be interested in attending a school for science and technology.
16. Only eleventh and twelfth grade students should attend the school for science and technology.
17. Students should be required to pass an entrance examination to be admitted to the school for science and technology.
18. The school day should include considerable time scheduled for science and technology laboratories.
19. All students attending this school should be required to develop science projects for science fair competitions.

20. The school should have a longer day (more than six class periods per day).

21. All students attending this school should be required to spend some part of their school year outside of school in local science and technology companies.

22. The school should have some part-time teachers, such as scientists and engineers, from business and industry.

23. Do you intend to go to college after graduating from high school.?

A. Yes B. No C. Uncertain

24. Do you plan to enter a career in a scientific, engineering or technology related field?

A. Yes B. No C. Uncertain

25. If you intend to go to college, which field would you most likely select as your major?

A. Biology
B. Physics
C. Chemistry
D. Other science
E. None of these

26. A. Computer science
B. Mathematics
C. Engineering
D. Other technical field
E. I probably would not major in science, math, or a technical field.

27. If the proposed high school for science and technology had been open this year for students at your grade level, do you think you would have applied?

A. Yes B. No C. Uncertain

STOP!

Make sure all spaces on your answer sheet after number 27 are blank. Hold your answer sheet and questionnaire until collected.

Thank you for your cooperation.